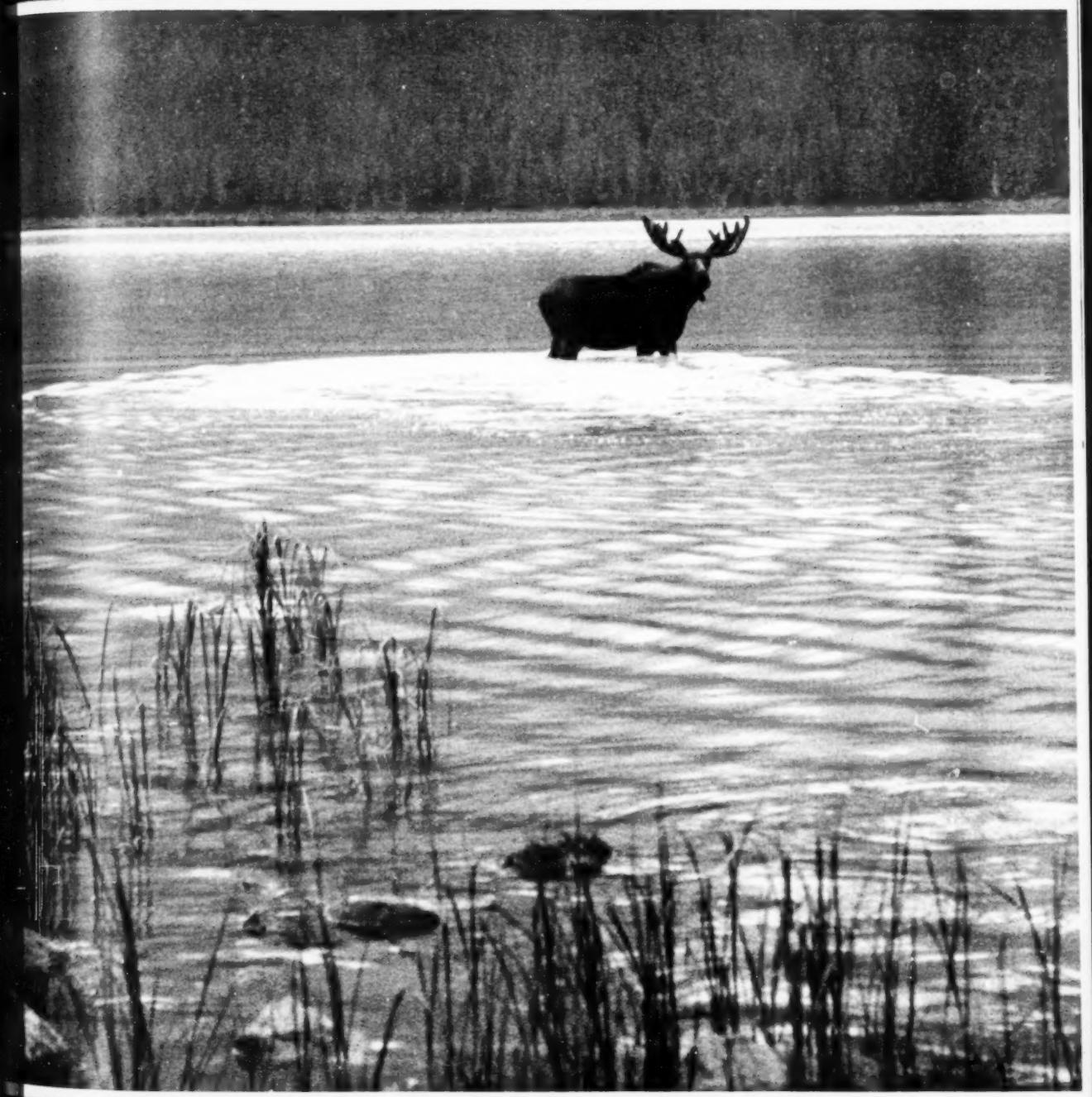
AMERICAN FORESTS



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AMERICAN FORESTS

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Erle Kauffman

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THE AMERICAN FORESTRY ASSOCIATION

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The American Forestry Association is a citizens' organization for the advancement of intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation.

Its educational activities seek to bring about a better appreciation and handling of these resources, whether publicly or privately owned, that they may contribute in the highest degree to the welfare of the nation and its people.

In addition to publication of two magazines — AMERICAN FORESTS and CONSERVATION, both designed to keep before the people of the country important conservation questions and issues, the Association carries on educational projects in various fields including forest fire prevention, reforestation, protection of fish and wildlife, upstream flood control, prevention of soil erosion, preservation of wilderness areas, establishment of national forests and parks, development of forestry by private endeavor, the teaching of conservation in the schools of the country, promotion of research in timber growing and use and expansion of markets for forest products.

The Association is independent. It has no connection with any federal or state governments. It is non-political and non-commercial. All its resources and income are devoted to the advancement of conservation. It has been so operated since its founding in 1875. All citizens interested in forestry and conservation are eligible for membership.

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Who's Who

Among the Authors in this Issue

Leonard I. Barrett

LEONARD I. BARRETT (*War Revives An Old Industry*) started his forestry career in the woods, as a lookout, field assistant and forest ranger on national forests of the West. For the last fifteen years, he has been engaged in forest research and is now chief of the division of Forest Management Research of the Appalachian Forest Experiment Station, at Asheville.

GRACE V. SHARRITT (*Thanksgiving—1941*) free-lances from Detroit, Michigan. She does a regular feature for the *Free Press*, and her delightful natural history bits appear in the *Monitor* and national magazines in the field.

Chapin Collins

CHAPIN COLLINS (*Firemen in the Woods*) is editor and publisher of the *Montesano Vidette*. Born in Seattle, he was graduated from the University of Washington. After several years of publicity and newspaper work, he went to Montesano, which is the county seat of the Grays Harbor region and just a few miles from the now famous Clemons Tree Farm, of which he writes here.

JOHN V. YOUNG (*The Crazy Forest*), a native Californian, is country editor of the San Jose *Mercury Herald*. A lover of mountains and forests, he has hiked and driven over California, Nevada and Oregon — his hobbies being forestry, photography, and the history of the Santa Cruz Mountains.

Ross L. Holman

ROSS L. HOLMAN (*Hunting Wild Boar*), editor and former farmer, of Nashville, Tennessee, is intensely interested in agricultural matters and a prolific writer, contributing to many general outdoor magazines.

ORMAL I. SPRUNGMAN (*Fish That Eat Ducks*), cameraman and conservationist, seeks the unusual in the photographic field. He has been writing and taking pictures since his graduation from the University of Minnesota, pursuing his subjects largely in the wild. Fishing, hunting and packing in Montana, he has tramped Alaska and the Yukon and filmed the moose on Isle Royale, and for the past seven years, he has handled the camera department for *Sports Afield*.

E. B. MOORE (*Timber Rafting on the Delaware*) is a Yale man, class of '26, and ever since—except for one year devoted to graduate work in game management—has been with the Department of Conservation of New Jersey, where he devotes his time to silviculture and management of woodlands and game.

Carl R. Swartzlow

CARL R. SWARTZLOW (*The Mountain That Breathes Fire*) writes from Lassen Volcanic National Park, in California. A native of Wisconsin, Dr. Swartzlow has degrees in science from the Universities of Wisconsin and Missouri, where he later taught. Specializing in physics, geology and mineralogy, he has written widely both for scientific and popular publications.

YRJO ILVESSALO (*The War and Finnish Forestry*) is a brilliantly educated forester of Finland, born in Tampere. His graduate studies and research work were conducted in many European countries and in the United States and Canada. Active in the forestry work of Finland, he has published a number of important papers and has been honored by the Finnish Academy of Science and received the decoration of the Finnish White Rose, Commander 2nd Class. In 1940 he was made an honorary member of The American Forestry Association.

Leslie D. Percey

LESLIE D. PERCEY (*Do Juvenile Forestry Camps Pay?*) is a Californian, attached to the Los Angeles County Department of Forests and Fire Warden. His work is watershed protection and construction and maintenance of improvements, three of the juvenile forestry camps — of which he writes so interestingly here—being under his supervision and direction.

THE COVER—"King of the Wildwood"—Photograph by W. Annable.

ROADS BRING THE FORESTS NEARER

THOUGH the mountain refused to come to Mahomet, a road like this might have served to make it more accessible — which would have been the same as bringing it nearer.

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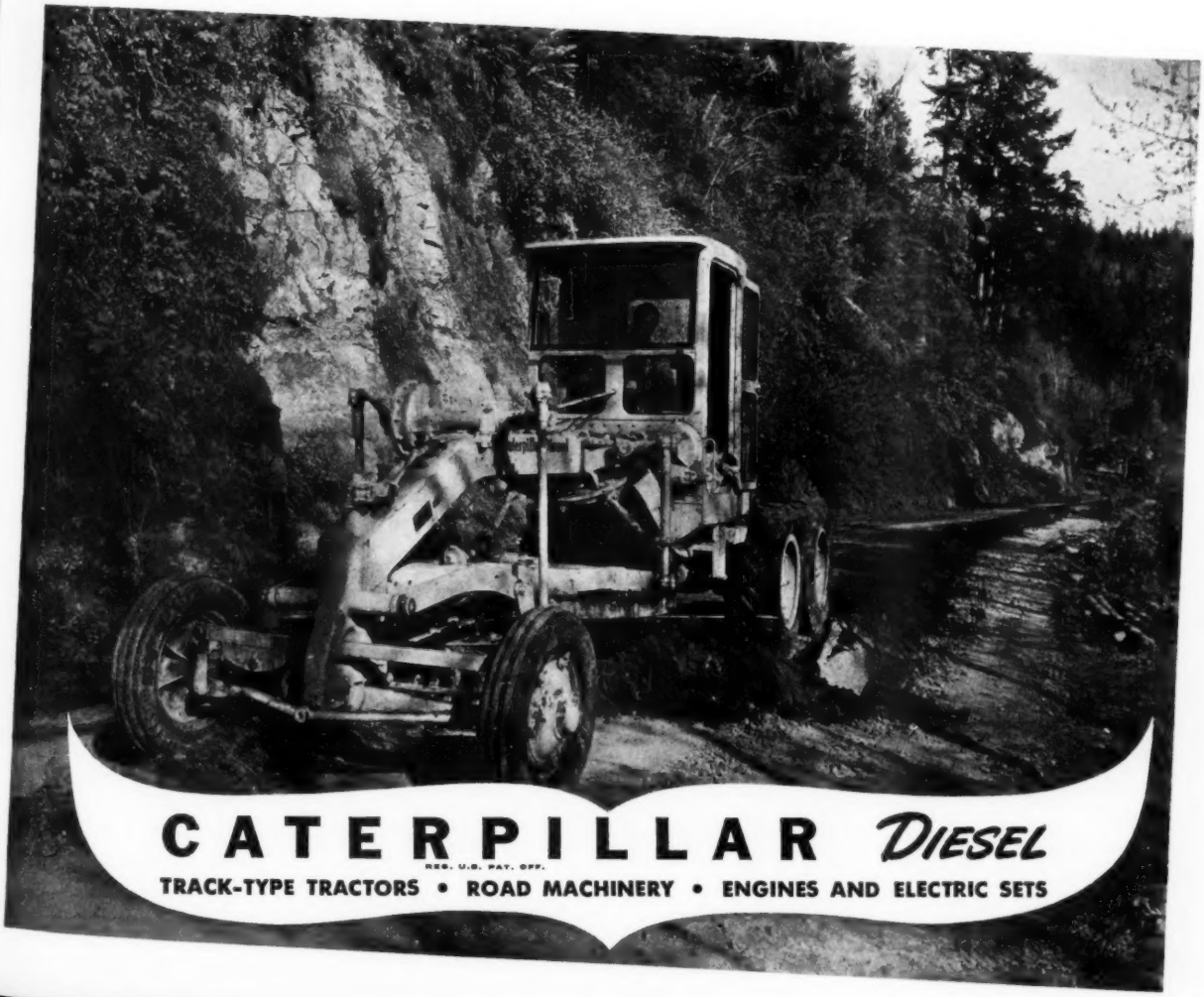

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BIG TREES

Oregon Yields to Washington

Washington's Queets fir is larger than Oregon's Lloyd fir

The American Forestry Association is sponsoring a national hunt for the discovery and preservation of the largest specimens of the different species of typical American trees. Locate, measure and nominate your candidate in this competition. ACT NOW to make known and save the largest specimens of America's trees. For further details, send for the Association's special announcement of this Big Tree hunt. Mail your nomination with records and pictures to The American Forestry Association, 919 17th Street, Northwest, Washington, D. C.

YOUR big tree editor never doubted when Forester Les. D. Lloyd wrote in about the giant Douglas fir, *Pseudotsuga taxifolia*, which he had discovered near Seaside, Oregon, that this tree would permanently hold top place among Douglas firs in the big tree campaign. But no sooner had the story of Forester Lloyd's tree gone to press for the September issue of AMERICAN FORESTS, than along came a letter from Superintendent Preston P. Macy of Olympic National Park, Washington, telling about a larger one growing in the fantastic, moss-draped Olympic rain forest beside the Queets River within the national park. This tree measures fifty-three feet four inches in circumference, seventeen feet one inch in diameter and 221 feet tall, with its trunk clear of limbs for over one hundred feet. It is in good health, and is estimated to be 1400 years old. Is it possible that a larger Douglas fir exists?

Park Ranger Oscar Kuntz who measured the tree is shown in the picture with his wife.

OCTOBER brought the lowly aspen, a tree held in warm esteem by those who know it best, into the headlines. Governor John E. Miles of New Mexico by special proclamation designated October 1-7 as "Aspen Week" for New Mexicans in homage of the autumnal beauty of the tree. "Nature," said the Governor in effect, "stages one of the most gorgeous sights of creation when the aspen forests on our mountain slopes pan out their gold in the fall. Let us go forth and partake of their beauty. It will gladden our hearts and inspire us all to give better protection to our forests."

And so it will. If you have never seen a mountainside splashed with the fall yellows of the trembling aspen, you have indeed missed one of nature's inspiring pageants. A small tree as trees go, the aspen is one of a family of eleven poplars or cottonwoods found in the United States. Populous Tremuloides is his christened name, but like most beloved and friendly persons he has numerous nicknames, the most common of which is "Quaking Asp." He is a hail-fellow-well-met, cosmopolitan, courageous and gentle as the summer breeze that stirs his leaves into instant laughter. In his northern range he rollicks across the country from ocean to ocean and down the western mountains into Mexico consorting with trees of high and low degree. Undaunted he battles winter snows and is crushed, bent and twisted by their sodden weight, but in the spring he is up and on again, his gray catkins waving and his green leaves trembling with an ecstasy of life that seems to laugh off the hardships of winter. Man might well take a leaf from the lowly aspen tree.

* * * * * *

Mr. Barrett's interesting article in this issue—"War Revives An Old Industry"—brings up again a question that has been asked down the ages. It relates to one of those mysteries of nature that science has as yet failed to unravel. In the case of Mr. Barrett's article, the question specifically is "What causes burls to form at the base of certain laurel and rhododendron plants and not others?"

As to the formation of wood burls in general, students of the subject have various explanations. Some attribute them to the localized development of many dormant buds the growth of which has been stimulated by injuries resulting from a variety of causes, among them the stinging of insects, frost bite, fire and mechanical abrasions. Another explanation is that they are caused by a disease. And then there is the record of an Italian who induced burl formations in boxwood by fitting tight metal bands around the stems of the plants.

Querying Mr. Barrett on the question, he writes: "About the only thing we seem reasonably sure of in the case of rhododendron and laurel burls is that they are in some way connected with a concentration of dormant buds which continue to live but never develop into stems or sprouts. Their presence interrupts evenness of grain and causes the eccentric growth resulting in the much desired figure. However, we do not know what causes this concentration of dormant buds."

* * * * * *

Massachusetts is the latest state to adopt a state tree. By special act of its current legislature the chickadee has been named the state bird and the American elm the state tree. According to the records of The American Forestry Association, Massachusetts is the seventeenth state that has officially adopted a state tree. California has put its seal on the redwood, Delaware has chosen the American holly, Georgia the southern pine, Idaho the western white pine, Illinois the bur oak, Indiana the yellow poplar or tulip tree, Louisiana and Mississippi the magnolia, Missouri the hawthorne, Pennsylvania the hemlock, Rhode Island the maple, South Carolina the palmetto, Texas the pecan, Utah the blue spruce, Virginia the flowering dogwood, and Maryland the sturdy old white oak. Some fifteen other states report trees "unofficially" selected.

Ona Butler

Editor.

William Edwin Booth

Thanksgiving — 1941

By GRACE V. SHARRITT

It is the eve of Thanksgiving. A silver curve of new moon, just above the mauve horizon, gleams a silent benediction upon a waning year. So many good things for which to be thankful! Trees, tall and sturdy, etch this indelible message in a fresco of charcoal traceries against the fading pinks and lavenders of a peaceful sky.

Still and beautiful is the twilight hour. Quiet, save for a low wind which murmurs among brown grain stubbles of "work well done"; of plantings and harvests, of granaries filled with yellow corn; of barn-lofts stacked with ripened grains and cellars and storage closets packed with jars and brimming crocks.

From the mountains to the plains, hickory nuts are drying on attic floors. Squash and pumpkins have been gathered. Potatoes and apples are binned. Strings of peppers and drying herbs hang in sunny kitchen corners. A land of plenty this Thanksgiving Eve — 1941. Gifts of the earth for which to give thanks.

A star appears in the deepening sky. It is symbolic of those richer, but less tangible blessings of the soil. The blessing of sensitiveness to beauty, an awareness of happiness in small things.

Truly blessed is he who, hearing the lilt of a bird's song, can recall the melody vividly to mind long after the singer has gone. Truly blessed is he who, seeing the fleeting loveliness of an azure butterfly wing, treasures the memory and at will can bring it to mind on days darkened with sorrow or loneliness.

Material possessions may be taken away. But the enduring gift is that awareness and sensitiveness to the common things of life. Remember the fragrance of morning dew on June clover? Or the poignant beauty of a summer sunset? Can you still feel the coolness of April rain upon your cheek? Taste again the sweetness of wild strawberries found on a hill? Then, indeed, are you truly blessed, for these gifts of the spirit are for eternity. Ephemeral but lasting, simple but priceless, this blessing is one for which to give thanks.

* * * *

Twilight has deepened into dusk. A silver sheath slips into the darkening horizon and the stillness of silent prayer is upon a beautiful land. Yellowed grasses rustle softly in the night wind like the ghostly robes of ancient monks. Somewhere, far away, a bird twirls shining notes into song. A song which echoes, "For this we give thanks."

WAR REVIVES AN OLD INDUSTRY

Appalachian Forests Are Meeting the Shortage of Imported Brier Wood for American Pipe Smokers

By LEONARD I. BARRETT
Photographs by the Forest Service

HISTORY usually credits the mound building aborigines of North America as the originators of pipe smoking. Early colonists found this custom prevalent among Indian tribes and their methods of cultivating tobacco plants, which are native only to the Americas, was imitated by colonial farmers and formed the basis for the existing tobacco industry so important to the southeastern United States.

Beginning in 1612 at Jamestown, the growing of tobacco in the United States has increased steadily until present normal annual production is in the neighborhood of one and one-third billion pounds, with a value to growers of about 250 million dollars. The custom of smoking tobacco in pipes has also grown and the manufacture of pipes has increased from a business valued at less than fifty thousand dollars prior to 1860, to an industry whose present production is valued at nearly eight million dollars. Clay, stone, meerschaum, porcelain, calabash gourds, corn cobs and even copper have been used in the manufacture of pipes, but the most common material used today is wood.

The wood best suited to the manufacture of smoking pipes was found to grow in the countries which border the Mediterranean Sea. Here a shrubby plant of the heath family, more commonly known as brier, develops a root burl or large spherical swelling at the ground line. The wood of these burls is absorbent and fire resistant, and has a grain of beautiful figure—characteristics which have made it the standard pipe wood for many years. Rough blocks of varying size and shape are sawed from these burls, seasoned and exported to other countries where final manufacture takes place. Although estimates of United States annual requirements vary, opinions of several pipe manufacturers checked by U. S. Customs records indicate that about thirty million blocks have been imported annually from Mediterranean countries.

The present and past World Wars resulted in almost complete cessation of these imports and American manufacturers were forced to look for domestic sources of pipe stock. During World War I, American woods inferior to brier necessarily were used when imported stocks became depleted, but the search for substitutes directed attention to the immense thickets of mountain laurel (*Kalmia latifolia*) and rhododendron (*Rhododendron maxima*), which are common in the southern Appalachian Mountains. These evergreen shrubs known to nature lovers and conservationists primarily for the beauty of their blossoms have some characteristics in common with the Mediterranean brier. At advanced ages some of the shrubs produce root burls very like brier in appearance, and their wood is characterized by a similarly beautiful figure.

That these burls are suitable for pipe manufacture was known for many years prior to the first World War. Sporadic attempts were made to manufacture pipes from mountain laurel root burls, but competition by the imported brier was too severe and all attempts were short-lived. In 1910, a report on the wood-using industries of North Carolina was published by the North Carolina Geological and Economic Survey. The use of mountain laurel for pipe manufacture is mentioned here and a tabulation shows that about forty tons of burls were used during the year.

It was to be expected, therefore, that a search for brier replacements would include further trials of laurel and rhododendron. Pipe stock operations were renewed and expanded in North Carolina during the period 1918 to 1920. These operations, however, were poorly financed, methods of sawing and curing blocks not well understood, and at the conclusion of the war, local industry was unable to meet the competition of the cheaper imported brier.

With the start of another European war in 1939 pipe manufacturers again appeared in the southern Appalachians to investigate the possibilities of home sources of raw material and by the early summer of 1941 seven pipe block plants, most of them using laurel burls exclusively, were in operation. Six of these are in western North Carolina and one in eastern Tennessee. They vary considerably in size, requiring from two to fifty tons of burls a week. The combined weekly requirement of all seven plants is approximately 196 tons. The plants saw an average of about 900 blocks from one ton of burls so that at present capacity, the industry produces about 176,000 blocks weekly.

If these plants should operate only forty-six weeks out of the year their production would amount to slightly over 8,000,000 blocks annually. This indicates that apparently about one-fourth of the entire requirements of the United States is provided by the present southern Appalachian industry. Remaining needs are doubtless being met by stocks of Mediterranean brier still on hand and as those are depleted an expansion of the home industry is a reasonable expectation.

A summary of interviews with plant managers and woods foremen indicates that the new industry has created about 1,150 man-days of labor a week for woods workers and mill hands recruited locally. At current wages the yearly returns to labor amount to at least $150,000. In addition, returns to landowners for burl digging privileges vary somewhat, but average prices are from $1 to $1.25 a ton with a probable total local return of $10,000 to $12,000 yearly.

To insure a steady supply all mills operate a woods

force, but most of them will also accept independent farmer delivery of the burls either at the mill or roadside. At the mill, prices range from $10 to $12 a ton and represent returns to the farmer for stumpage, labor and transportation. If delivered at the roadside to be picked up by company trucks, about $2 a ton less than the mill price is paid. Many mountain farmers have taken advantage of this market for a product heretofore valueless to them, benefiting from this opportunity. For example, the names of over 150 individuals from whom burls had been purchased appeared on the books of one mill at the end of the first eight months of operation. Thus the new industry, although small by some comparisons, has been a real contribution to the living standards of hundreds of mountain people in a region where annual cash incomes are unbelievably meager.

Upper—The holes or "craters" where burls were removed are soon covered. This picture was taken about three months after the burls were dug. Note the burl at the base of the laurel stem in foreground, apparently too small or defective to be harvested for pipe blocks

Lower—A woods opening in the Pisgah National Forest after digging was completed. In the opening, which is fifty to sixty feet in diameter, a clump of uncut rhododendron remains in the center

However, the industry has been the cause of much very real concern by those whose primary interest in Appalachian forests is the enjoyment and preservation of their natural beauty. They want to know if burl-digging operations destroy the existing stands of laurel and rhododendron and thus remove an attractive scenic feature of the Appalachian country? A description of burl - digging operations as they are conducted today provides a rather clearcut answer to this question.

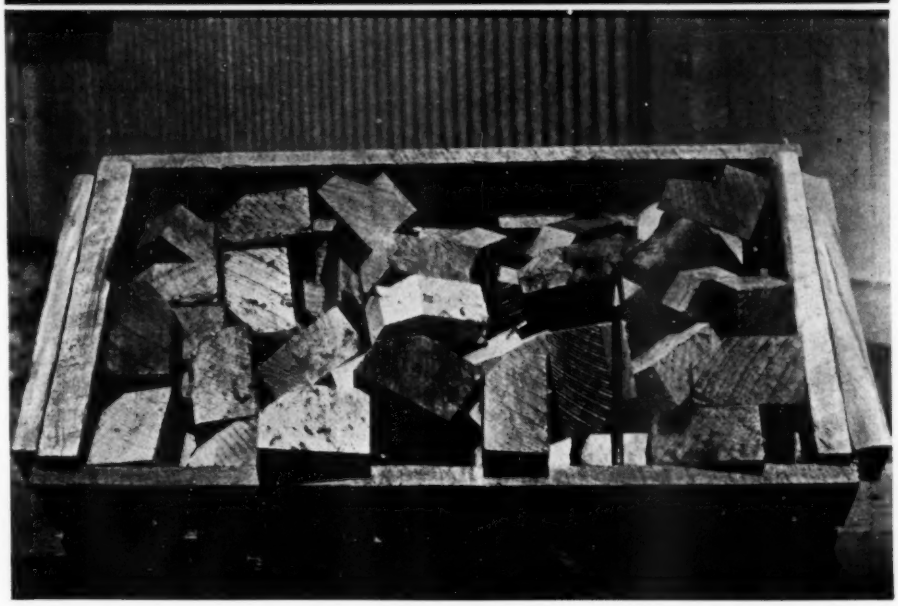
In harvesting burls the first step is to find them—a seemingly unimportant problem in a region where the plants grow in such profusion. However, much strenuous hiking, climbing and worming through dense thickets by scouts is usually required to locate an area from which a few tons of burls can be removed. Frequently the presence of burls is readily detected because the abnormal swelling at the base of a laurel or rhododendron stem begins several inches above the ground line and is thus easily seen. Sometimes the burls are deeper in the soil and layers of forest litter or moss cover the upper

portion of the swelling. Here the scouts scrape back the loose layers of moss and leaves or feel beneath them with their hands to determine if burls are present.

Whole watersheds as large as ten or fifteen thousand acres have been scouted without discovery of sufficient burls to warrant a burl-digging operation, although within such an area two or three thousand acres of laurel thickets may occur. When burls are found they usually occur in clumps of from four to five to possibly two dozen plants. Rarely over an area as large as one acre do all the plants have burls. Small clumps may be scattered over areas as small as two or three acres but seldom does the gross area in which the clumps occur exceed two or three hundred acres.

After an area is found, digging crews of from three to nine men harvest the burls, usually by means of a small block and tackle rig of the stump-puller or fence-stretcher type. The main stem of the plant is cut off one or two feet above the ground and a chain attached to the stump. As leverage is applied, the burl is lifted slightly and roots attached to it appear at the ground surface and are severed with an ax. This process of lifting and cutting of roots as they appear is repeated until the burl is completely removed from the ground. Burls weighing from twenty-five to thirty pounds are about the minimum size acceptable and weights 100 to 200 pounds are fairly common. The largest burl of which there is record weighed 600 pounds. The average weight of the burls sawed in the Carolina mills is about eighty pounds.

On many private lands removal of burls completes woods operations. However, where purchases from national forest lands have been made, the contracts or permits for operation require that all tops of unused plants be laid flat on the ground. This is done so that they will decay quickly and thus remove the fire hazard which commonly accompanies accumulations of brush and "slash" left after nearly all types of forest cuttings. Another clause in the contracts or permits enforced by forest supervisors or rangers requires the leaving of undisturbed strips on both sides of main-traveled highways and other public thoroughfares of the forest road system. Packing of brush in skid roads, on slopes especial-



Upper—Here about one and one-half tons of burls have been sledded out of a sale area in the Pisgah National Forest. After digging, the burls are transported usually by horse- or mule-drawn sleds to yards or assembly points near roads, where they are picked up by trucks and taken to the mills

Lower—This crate of blocks is ready for boiling. Some of the four to six combinations of size and shape usually manufactured are shown above. This new American war-born industry produces 176,000 pipe blocks weekly

ly, is also required to prevent erosion and the creation of unsightly gullies. Some operators also follow these national forest practices, at least in part, on private lands.

Operations on either private or public lands open up the thicket by removal of the clumps of plants. Openings may be only a few feet in diameter where two or three burls have been removed, or forty to fifty feet in diameter where several dozen were taken. Occasionally openings may be one-fourth to one-third acre in size, but rarely are they larger. Between these openings the thicket remains untouched except where narrow sled roads have been cut through. Trees of the native forest may be absent or present in varying numbers, depending upon the logging history of the locality. If there has been only partial or no removal of timber, the laurel or rhododendron thicket forms an understory beneath the forest canopy.

If logging has been heavy, the few scattered trees remaining will be mostly those left because some defect rendered them unsuitable for lumber. Sometimes where all trees were removed, laurel or rhododendron may be the primary vegetation on the ground. Thus, a laurel or rhododendron thicket operated for burls consists of a series of small openings separated by stands of untouched plants with large trees in varying numbers scattered over the area. In the blooming season and at a distance, the effects of the operation are quite unnoticeable to any but one very intimately acquainted with a particular area.

A further clue to the extent of burl-digging operations is found in the timber sale records of the Pisgah National Forest in western North Carolina. On one ranger district of this forest, five separate sales of burls had been made at the time of this writing. The total area in this ranger district is 155,000 acres and the total gross area within the five sale areas was about 1,250 acres. A recent inspection of these operations by the writer resulted in the estimate that digging had affected not over twenty-five per cent of the total gross area in all five sale units.

Growth quickly follows pipe block operations. Here, near Celo, North Carolina, burls were dug on about five acres in 1920. There was an exceptional concentration of burls and a high proportion of the plants were removed. The area has come back in dense young growth of hemlock, yellow poplar, red maple, laurel and rhododendron on the old digging

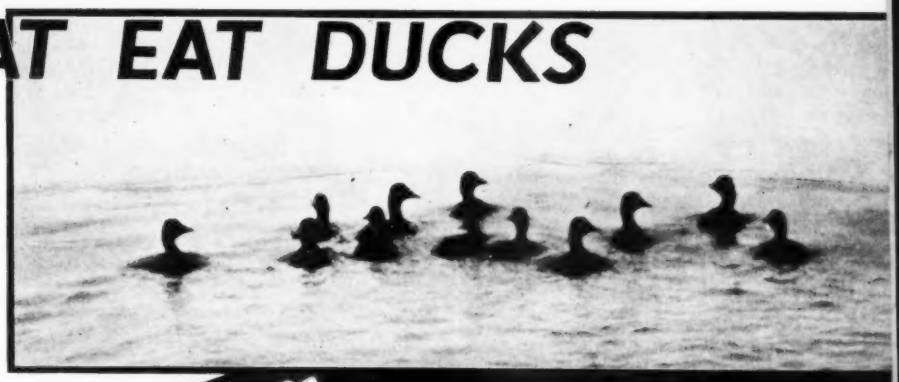
The amount of pipe stock obtained from national forest lands has been a rather small part of the entire requirements. For example, a period of active purchases from national forest areas occurred between the middle of October, 1940, and the end of February, 1941. During the eighteen weeks of this period, 780 tons of burls were purchased from national forests in western North Carolina. This is an average of about forty-three tons a week or approximately twenty-two per cent of the 196 tons weekly required by the industry.

Explanations are not entirely satisfactory as to why so small a proportion of the total forest area occupied by laurel and rhododendron contains burl-bearing plants. Probably the most credible theory is based on the advanced ages of plants which bear commercial burls and the fact that widespread forest fire control in Appalachian states dates back to about 1912 or 1914, a little less than thirty years ago. Although some of the faster growing rhododendron plants (*Continuing on page* 543)

FISH THAT EAT DUCKS

By

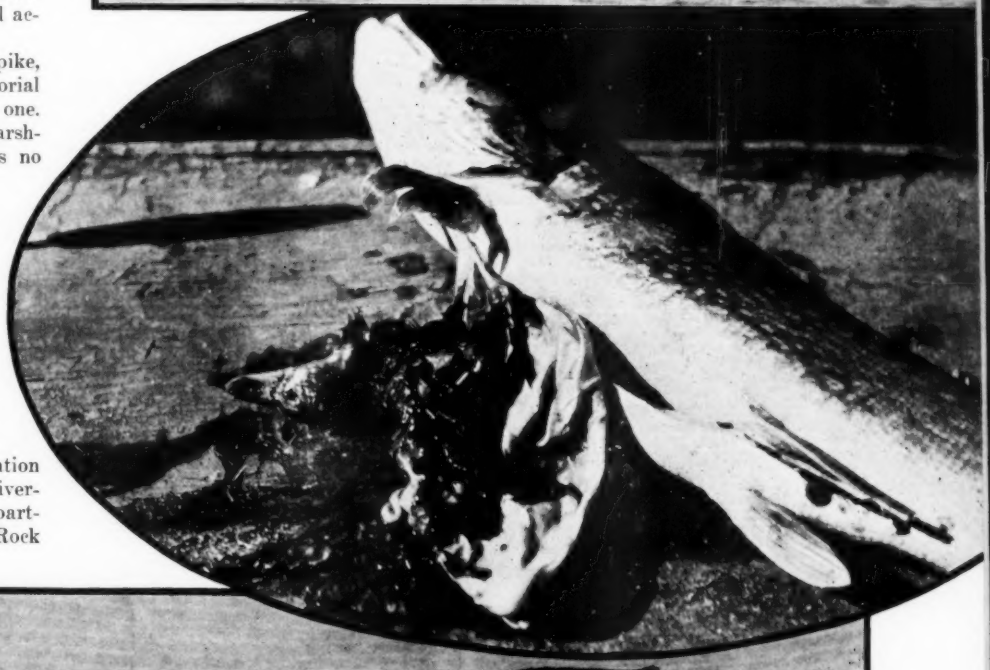
Ormal I. Sprungman

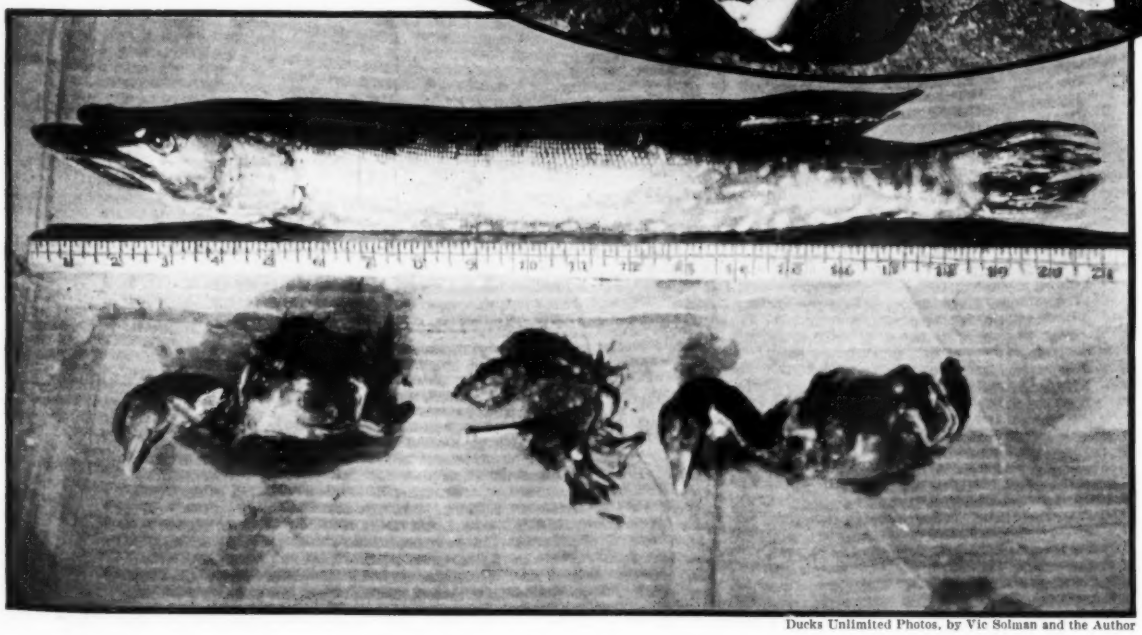


AMERICA'S sportsmen are familiar with ducks that eat fish, but up in the great waterfowl breeding grounds of the Canadian North lurks a fresh water fish that turns the tables and actually feeds on ducks.

Not unlike the northern pike, Canada's jackfish is a piscatorial scoundrel if there ever was one. Inhabiting the shallow marshlands, the jackfish furnishes no sport. Even its flesh is muddy. A scaly cannibal, it preys on its less fortunate finny brethren, occasionally devouring muskrats and live ducklings.

Last fall while shooting movies and stills for Ducks Unlimited in Canada, I had an opportunity to look in on studies of jackfish predation which Vic Solman of the University of Toronto biology department was making at Red Rock





Ducks Unlimited Photos, by Vic Solman and the Author

Lake in the Saskatchewan River country. Here I saw freshly swallowed and half-digested ducklings being removed from the bellies of jackfish. The pictures on this page vividly tell the story. It is not unusual for ducklings taking their first swimming lessons to be snatched off by hungry jackfish lurking beneath the marsh surface. Solman told me that last summer an average of seven out of every hundred jackfish he examined contained ducklings.

FIREMEN IN THE WOODS

What a Company and a Community Are Doing to Protect Their Forest Resources

By CHAPIN COLLINS

WHEN the lookout atop Miñot Peak on the Clemons Tree Farm in Grays Harbor county, Washington, spotted a column of smoke at 1:40 o'clock one hot, dry afternoon in July, he didn't realize he was starting something new in the Douglas fir region of the Pacific Northwest. He had one idea in mind . . . speed. The thermometer stood at ninety-seven degrees, and the hygrometer showed humidity was at the dangerously low level of thirty-two per cent.

Speed! In a moment he was on the 'phone with the reading from his Osborne fire finder . . . and a city fire department in the woods was set in motion.

The dispatcher who received his alarm quickly obtained another report from a second lookout, plotted the fire's location and telephoned the district fire station nearest the blaze.

By 1:43, a fire engine—a one-ton tanker truck carrying 300 gallons of water and hose lines—was on its way. It reached the fire at 1:49.

Within two minutes, 950 feet of hose were laid. Thirteen minutes and forty seconds from the time of detection, water was on the blaze. Less than 300 gallons were required to extinguish a blaze about to sweep through 2,000 acres of new growth forest.

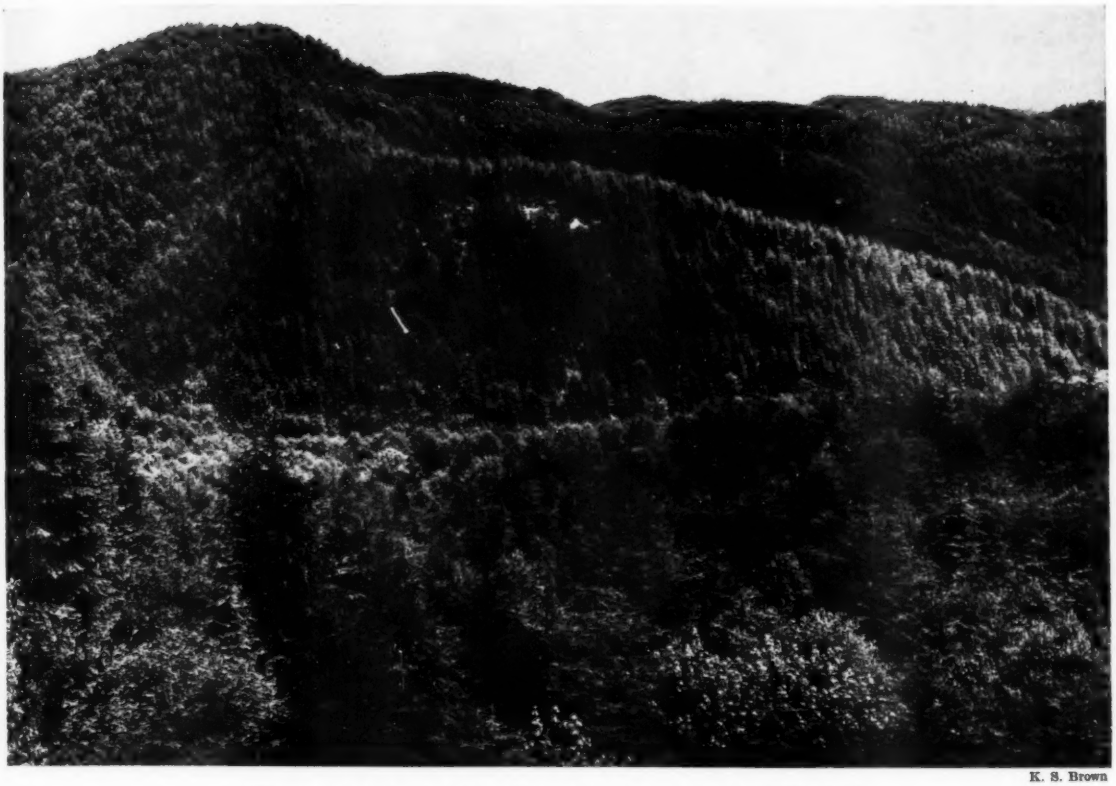
This was the first fire on the new Clemons Tree Farm, a 130,000-acre project of the Weyerhaeuser Timber Company, the first test of a new idea in forest fire fighting in the Pacific Northwest which, simply enough, is merely the application of what every city fire chief knows . . . "fast work on a small fire means no work on a big one."

* * * * *

Little more than a half century ago, the American forest industry completed its westward march across the

K. S. Brown

Fire prevention and control is the job of the "firemen in the woods" at the Clemons tree farm. Here are two of the tanker-trucks at work—actually fighting fire on the tree-farm. Quick action held the fire from the inflammable debris on the steep bank above, saved the young growth and quite possibly avoided a serious conflagration



K. S. Brown

Where fire is kept out, nature will produce a tree crop such as this stand of fine second-growth in the Clemons tree farm, now about fifteen years old

continent. When it reached the beaches of the Pacific ocean, people didn't realize that the beginning of the end of a limitless timber supply had come. Timber resources of Washington, Oregon and northern California were believed "inexhaustible," and so they were, then, when ox teams hauled logs down skid roads slower than nature was producing new growth.

But, in the later days when the port of Grays Harbor in Washington was shipping better than a billion board feet of lumber each year—as it did from 1925 to 1929—and other lumber ports were sending out timber in like proportion, nature began to lose the race. It became obvious to the far-sighted that "inexhaustible" was an elastic term already stretched to the limit, and now on the rebound.

By the time such ideas as "selective logging" and "perpetual yield" emerged from the minds of foresters and began to appear in practice, there weren't any too many horses left in the barn.

Yet, along this western slope, nature herself was valiantly suggesting the answer. The answer, in the form of millions of naturally seeded young trees, demonstrated that timber industries, even if they couldn't move westward any more, needn't fold up.

They could grow trees.

They could grow trees commercially, successfully, given several things:

First, such physical things as rapidity of growth, areas of sufficient size and *comparative freedom from fire.*

Second, such man-made things as a taxation system that wouldn't bleed an operation that must wait decades for its return; and new uses for wood, that would profitably utilize younger trees and a greater proportion of each tree.

A favorable combination of these factors appeared in the state of Washington. Rapidity of growth in the fog belt of western Washington and adjacent areas of mild climate and plentiful rain was well known. Then the people of the state, after a series of attempts, finally approved a reforestation law in 1931 which said to owners of cutover lands: "If your land is determined to be primarily suitable for reforestation, you may so declare it and pay a tax on the basis of a valuation of $1 an acre. Whenever you harvest wood products, you must then pay a yield tax of twelve and one-half per cent of the value of whatever you harvest."

Chemists, who had transformed hemlock into rayon, gave the answer to the problem of utilizing wood to the fullest extent. A tree, once only a source for lumber, gained myriad uses.

In Grays Harbor county, as elsewhere, large areas were under single ownerships.

There was the winning combination, with a reasonably satisfactory answer to every question, *except that of fire.*

When the state approved its far-reaching forest tax law, the Weyerhaeuser company, among others, started paying taxes again on lands long permitted to run up delinquencies. Weyerhaeuser decided, finally, to reverse the old policy of "cut and get out" and to substitute for it "cut and stay in."

Thus was conceived the Clemons Tree Farm, one of the first large privately owned permanent timber farms in the West.

Where C. H. Clemons, old-time logger who still lives in

Montesano, Grays Harbor county seat, started logging with oxen more than fifty years ago, this farm now has been established.

By 1941, most of the timber in the 130,000-acre area was gone. That timber had been legendary, of Paul Bunyan proportions. Seventy thousand board feet an acre was about an average cut from the 200 to 400 year old stand. It had run as high as 120,000 feet, enough to build seven five-room homes.

But the day of those giants was ending. Grays Harbor residents recalled regretfully the billion-feet years, and public officials mourned the loss of assessed valuations, which had dropped from $35,000,000 to $22,000,000, largely because of loss of timber.

Now came the Weyerhaeuser foresters and said they could and would grow and harvest even more timber from that same area than it had ever produced in its natural state, provided fire could be whipped.

Of the 130,000 acres, Weyerhaeuser owned about half. The state, which is cooperating in the plan, owned 15,000 acres, and the county another 15,000, which the company has proposed to purchase. A little less than 34,000 acres were under miscellaneous ownerships, including ranchers.

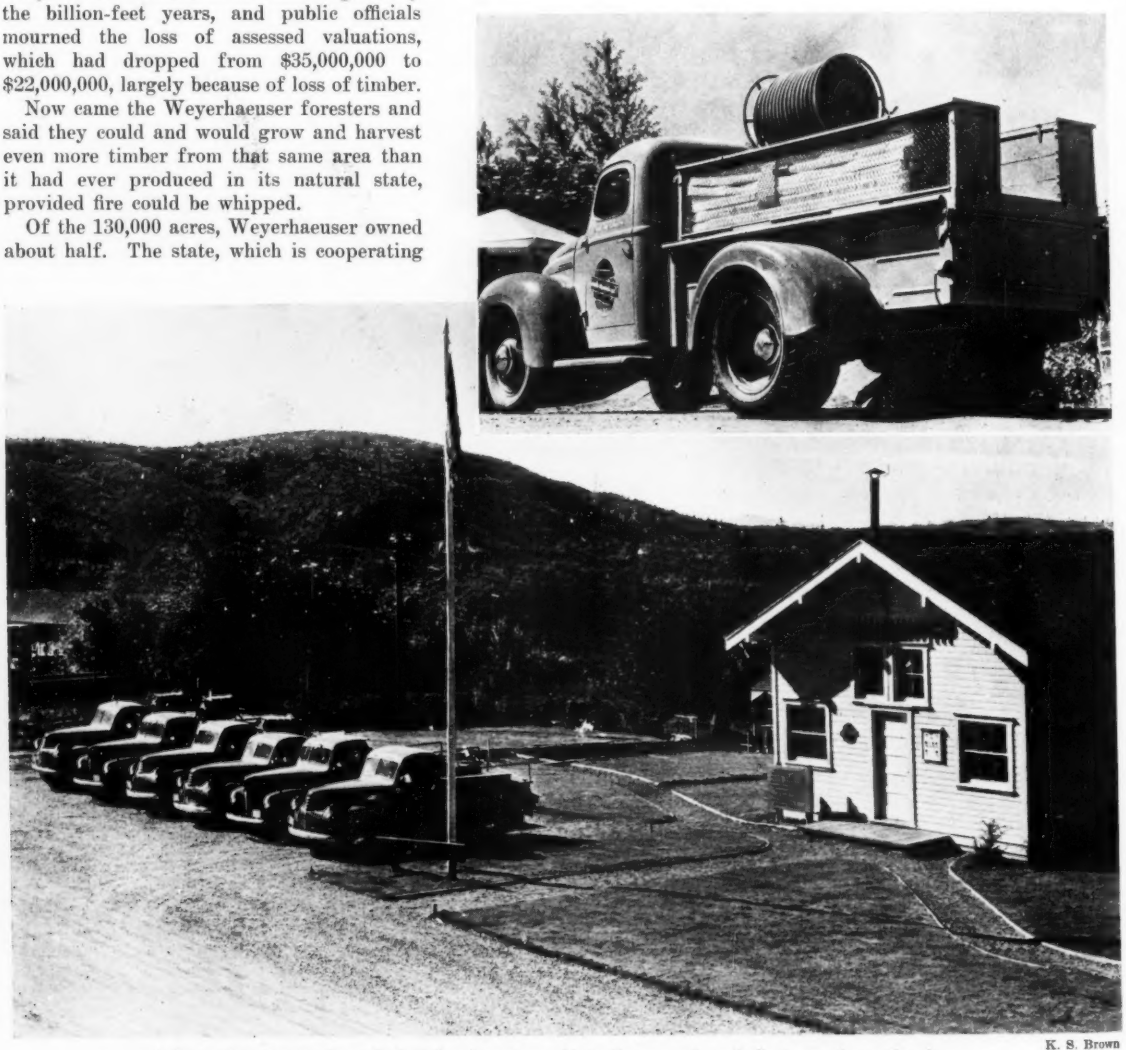
Over the area as a whole, some seventy-six per cent had been clear-cut, a little over nine per cent selectively logged, and three per cent was classified as agricultural land. Of the Weyerhaeuser-owned portion, only fifteen per cent remained in virgin timber.

After an elaborate study of reproduction, rate of growth, fire hazards and so on, this area was selected for a large tree farm experiment on a commercial scale, planned not as a philanthropic gesture, but as a sound business enterprise that would return wages, taxes and raw materials to the community and profits to the owner.

Tree farmers, combining a program of natural seed reproduction with actual planting of seedlings in denuded areas far from seed sources, declared the farm had within it the possibility of out-producing the natural forest, which produced at the rate of 70,000 board feet an acre in 200 to 400 years; under farm management, they said, it could produce 250,000 feet in a like period, through a succession of harvests. Trees would be cut between the ages of fifty and eighty years, just when they would have reached their period of maximum growth. Thus, every tree on the farm would be manufacturing wood at a peak rate.

This was the combination,—*all but fire control.*

To this problem, the (*Continuing on page* 542)



K. S. Brown

A fleet of tanker-trucks parked at headquarters. Note the row of symbolic trees above the doorway emphasizing the company's slogan of "Twenty new trees for every one cut." Inset—Close-up of one of the "fire-engines"—a one-ton truck carrying 300 gallons of water and more than a thousand feet of hose

THE CRAZY FOREST

By JOHN V. YOUNG

GLORYING in the splendors of its two great bridges, San Francisco has all but forgotten the great earthquake and fire that levelled the city thirty-five years ago. Nowhere in the metropolis, nor in her smaller sisters to the south, does the casual eye meet the last lingering trace of the temblor that rattled down the line of the San Andreas fault the morning of April 18, 1906. Only the geologist, the seismologist and the engineer know where to seek evidence of the earth's whimsical shrug that took an unreckoned toll of lives in its wavering course down 300 miles of California coast and valley. But in the Crazy Forest there is no such dearth of earthquake record.

Hard by Loma Prieta Peak, highest point in the Santa Cruz mountain range, seventy miles due south of San Francisco, at the headwaters of Soquel Creek, the Crazy Forest lies sprawled across a vast expanse of green wooded ridges, one of the largest virgin redwood stands remaining in the world—and the only one that grows crooked.

Far off the main highway, this region is traversed by only one road—and that road has been closed for two years by slides. Zigzagging through the eastern portion of this virgin stand runs the ragged tangle of topsy-turvy trees that men have come to call the Crazy Forest.

Clearly delineating the San Andreas fault, that crack in the earth's surface along which most of the coast's major quakes have occurred, this fifty-acre strip of forest giants was knocked into a Brobdignagian jackstraw pile when the great shake of 1906 slammed across the mountains just at dawn. The temblor hurled some trees, sturdy saplings when Christ was born, to destruction in Soquel Gorge, building a log jam that remains today.

It laid other redwoods flat; then from their recumbent forms new trees have sprung, and through years of struggling for light have formed dense clusters of redwood towers in ordered rows along the massive carcasses of their parents.

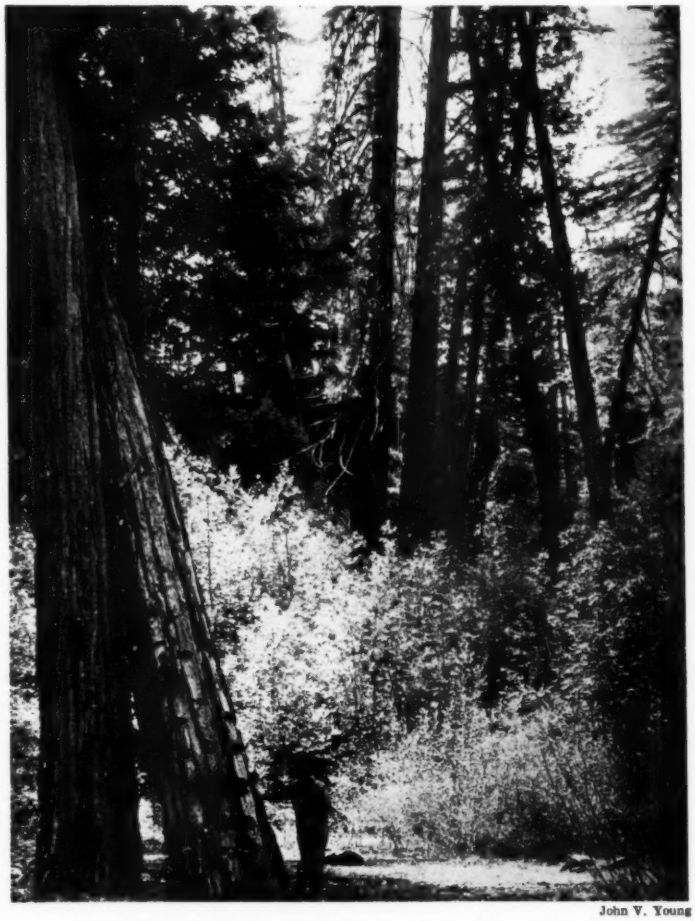
It threw still others by the hundred aslant, to come to rest with their tops entwined with the limbs of their neighbors to form vast, incredible tents two hundred feet above the earth. Some contrived to stand alone but with a drunken list to their trunks.

The quake opened crevices in the steep banks of the Soquel slope and tributary Amaya Creek, gave birth to leaping springs in rocky crannies. Some of these springs sparkle today, surrounded by enormous ferns. Old logging roads and trails, hopelessly blocked by crevices and fallen trees, have by virtue of the springs and the ferns become fairy lanes of greenery, mossy under foot, shaded overhead, fragrant throughout.

For fourteen years after the quake, a lake remained where a log jam blocked the creek, until erosion from a forest fire on the eastern slope filled the lake bed with mud. The lake is a morass today, from its murky depths arising the gaunt white skeletons of tall redwoods trapped by the waters and ravaged by the insects.

Elsewhere in the mountains the Southern Pacific has long since repaired the damage the quake did to its rails and tunnels from Los Gatos to Santa Cruz; the villages of Wrights and Burrell have straightened their twisted fences, rebuilt their homes and covered their scars.

Only the Crazy Forest remains as it was that morning, brooding over the prank Nature played on it, watching a logging crew gnaw at its northern boundary, waiting for the ax and the bandsaw to relegate it, too, to oblivion.



John V. Young

Tilted redwoods in the crazy forest — thrown that way by the earthquake of 1906. Their growth seemingly not disturbed, they are probably the only redwoods in the world that grow crooked

Head of a 300-pound "tusker"

HUNTING WILD BOAR

Dangerous Sport of Medieval Europe Revived in Eastern Tennessee

By ROSS L. HOLMAN

Photographs by Tennessee State Department of Conservation

IF you would like to take off on an old-fashioned wild boar chase in medieval European style, that exciting sport is now open to you in the Cherokee National Forest of Tennessee. You may go with hunting bugles and baying hounds or, if you prefer, with bow and arrows.

Back in 1912 a group of English gentlemen settled in the mountainous country of western North Carolina. The feel of the wilds was in their bones and as they looked over the dense forests and undergrowth of the region their blood tingled. Here was a land for modern nimrods. Traditions of their own country handed down from medieval knights of the chase no doubt inspired the idea of wild boar. Even though this splendid game animal had been blasted out of their own native land by modern hunting facilities, it was felt that it could be restored in the forested hills of Carolina. At least, it was worth trying.

So they sent to the Ural Mountains of Russia, secured fourteen fine specimens, and fenced them in a private area for their own sport. Answering the call of their country in the first World War, these gentlemen went back to Europe, leaving the wild porkers to their own resources. Forest fires tore big gaps in the fence surrounding the hunting preserve and they scampered away into the Great Smokies with the wide world for a range. Crossing the Tennessee line, they wandered into the Cherokee National Forest where they found abundant feeding grounds. Here they have remained to multiply and replenish that part of the earth.

At first, the federal government planned to exterminate the wild porkers as a menace to public safety. But sportsmen protested so vigorously that it was finally decided to extend to them the same protection given other game, and to set bag limits. The first open hunting season was permitted in 1936 under the supervision of the United States Forest Service and the Tennessee Department of Conservation.

The Cherokee National Forest, which embraces 1,200,000 acres of the mountainous district of eastern Tennessee, was at one time the hunting grounds of Cherokee Indians, and efforts are being made to restore to it most of the game that once roamed there. Open seasons are already permitted on bear and this year will be extended to deer. It is being rapidly stocked with wild turkeys, grouse, quail, opossums, coons and foxes. Streams and lakes abound in fish. The addition of the wild boar will make it a sportsman's paradise.

When you come to this region to hunt bear and deer there are certain rules of bear and deer psychology on which you can more or less depend. You know something of their habits and have some idea as to how they will behave when located or brought to bay. But one of the things that adds to the excitement of a boar hunt is that this animal is unpredictable. You never know what he will do. He may run like a scared rabbit or charge like a tiger at bay. In the latter case you had better be quick and efficient with your weapon.

Usually, however, a number of hunters go along together with a pack of well bred mountain dogs to do the preliminary work of rounding him up. There is always safety in numbers, especially when these numbers are augmented by seasoned and courageous canines. So if you have never hunted wild porker before, your best bet is to make yourself part of a crowd.

When the season first opened in 1936 wild boar chasers took to the happy hunting grounds with more enthusiasm than judgment. They were accompanied by native guides and dogs, both of which knew more about mountains than they did about wild boars. In the first melee several dogs were slashed beyond usefulness and some hunters emerged with painful gashes and wiser minds. Since then both sportsmen and dogs feel a profound respect for the boar's striking power when he decides to take the offensive.

The main thing that distinguishes the wild boar from his domestic prototype is a tusk protruding from his lower jaw. When cornered he can use it with startling efficiency. In their native haunts these animals may roam singly or in droves of from four to ten. During most of the day they usually sleep in heavy underbrush, coming out in the late afternoon to feed on herbs, roots, nuts, berries, eggs, ground-nesting birds and snakes.

In ancient Europe feudal lords rode forth on wild boar hunts to the music of bugles and baying hounds. Today, in the Cherokee National Forest, sportsmen "hoof it" without fanfare in true American fashion. But the thrill of the chase remains

U. S. Forest Service

While there have been some exciting brushes with the wild boar of the Cherokee National Forest, there have been no fatalities nor permanent injuries. Like any other hunt for dangerous game, the tyro should make his debut into this sport with experienced hunters and dogs. A little over a year ago, three hunters, with a pack of mountain-bred hounds, plunged into Cherokee's vast tangle of underbrush and timber to stalk this ferocious tusker. For hours they trekked up and down the steep slopes and through the matted valleys without picking up a scent. Finally, and rather unexpectedly, a huge tusker, partially obscured by a clump of spreading bushes, was located. In fact they were almost upon him.

Now that the object of their long search was at last discovered, the boar refused them time to go into a huddle to decide what to do about it. He made up his mind first. Singling out one of the hunters, and ignoring all the dogs, he charged. Now it isn't a very soothing feeling to see 300 pounds of hog lightning and dynamite bearing down upon you, but fortunately for the intended victim, one of the dogs leaped at the furious animal's head, causing him to change his course.

A "tusker" at bay — and this means action. Unpredictable, he may run like a scared rabbit or charge with the ferocity of a cornered tiger. It all depends upon his mood. If he charges, quick and efficient use of the weapon at hand is the best insurance against personal injury

But quick as a flash, the boar was charging again, this time knocking the sportsman down an embankment. He put so much momentum in his drive that he followed the hunter, rolling over and over, and before he could again take up the attack a well placed shot from one of the other sportsmen finished him.

Many hunters who return year after year to stalk the boar in his lair are now mingling twentieth century thrills with twelfth century romance. In regular feudal lord style they pursue their prey with a bow and many a tusker in the Cherokee National Forest has succumbed to the piercing of a steel tipped arrow. Most of the bows are of strong, flexible hickory and the steel points of the arrows are shaped somewhat like the old flint arrowheads used by the Indians. Hunting by this method is much more hazardous and demands a more complex skill than is required of the rifle. There are only one or two vital spots about the boar's anatomy where an arrow will lay him out the first shot. To pierce him anywhere else may only bring on greater fury and ferocity.

Mrs. Ed McNish, of Nashville, is one of the few longbow enthusiasts to bag a wild boar with an arrow

Two nimrods of the longbow who could now put many a feudal knight to shame are Ed and Tom McNish of Nashville. Armed with a bow and a full quiver of arrows, Ed and two companions, after an all-day hunt, discovered a boar in some underbrush. He was quickly encircled with a ring of canine fight and for several minutes battled furiously, charging one dog, then whirling to fight off another snapping at him from behind. Finally the three hunters came within his vision and he altered his strategy. Quitting the dogs, he made them the spearhead of his attack. Not being prepared for this change of boar tactics, McNish and his two companions retreated. Two of them found low-hanging limbs and put about fifteen feet of tree altitude between them and the boar, while McNish managed to reach the topside of a high boulder. The porker then turned again on the dogs, hurling one of them to his back. Just as he was about to rip him open an arrow from McNish's bow tore through his spinal cord and laid him out. He was a handsome prize, weighing 310 pounds.

Back in the days of Norman feudalism English ladies sat safely behind latticed windows watching their favorite knights ride forth with arrows and javelins to bring in the boar for the feast they were planning. Today, in Cherokee boar hunts, the knights and ladies go out together.

When Robert Burch, of Nashville, is not busy, hunting and fishing with Mrs. Burch is his chief hobby. In 1939 the wild boar fever caught them both and they plunged into the Cherokee forest with two guides. After hunting for many hours they separated. Mrs. Burch and one guide shortly came to an immense laurel thicket so dense as to be almost impenetrable. They worked around the edge of it until they discovered a tunneled pathway made by bears. Crawling on their hands and knees through this tunnel, they soon came upon a thicket where boars had been sleeping. They followed the tracks for an hour before sighting four or five of the animals on a sloping hillside. As they approached the boars took refuge in flight down the hill, and Mrs. Burch, swinging her rifle into position, bowled over a 250-pound tusker. At camp that night, where there was a large band of tired boar hunters, a number of he-men had to revise some preconceived notions about woman's inability to hit the side of a barn in rifle marksmanship. And they had to swallow plenty of envy, for Mrs. Burch was the only hunter in the crowd who brought in a boar that night.

Not to be outdone, another woman has shown that expert boar archery is not an exclusive prerogative of male hunters. Mrs. Ed McNish shares with her husband the honor of being one of the few longbow sportsmen who has obtained a bag limit with the skillful use of an arrow.

The Cherokee National Forest is now estimated to have a population of 500 wild boars. Until they have a chance to increase far beyond this number, the open season will be limited to twenty days and the bag limit confined to one boar. In some of the mountainous regions of the Forest still live typical mountaineers in primitive cabins reminiscent of pioneer days. Modern civilization has swept beyond them and they have indifferently let it pass. Their women still operate the old spinning wheel, card wool, spin thread, and turn out homespun clothes.

In this setting boar hunters mingle pioneer American atmosphere with a medieval European sport. After the day's chase they sit around their roaring camp fires and swap yarns in true colonial style.

TIMBER RAFTING ON THE DELAWARE

By E. B. MOORE

IN THE spread of civilization rivers have always played an important role, first as lanes of exploration and later as highways of trade. Thus to the Swedes, Dutch and English who settled in the valley of the lower Delaware, the river was a vital means of communication, for over it their products of timber and peltry passed out to the markets of the world.

The lower Delaware Valley originally was covered with heavy stands of mixed oak and other hardwoods with some pine along the Jersey side and white cedar on the tributary streams. As land was cleared and agriculture established, a thriving trade in forest products developed at Philadelphia. Ship building soon became an important industry, and extensive lumber and rafting operations were carried on throughout the region. As early as 1698, Gabriel Thomas wrote of "Timber River . . . . which hath its name from the great quantities of curious timber which they send in great floats to Philadelphia . . . . as oaks, pines, ash, chestnut and cedar." Toward the middle of the eighteenth century, however, cutting had made considerable inroads upon the more accessible stands and attention was already turning toward the timbered hinterlands up the river.

Examine the course of the Delaware, the character of the country through which it flows, and extremely variable conditions will be found. From the Bay, tidewater pushes upstream for a hundred miles to the "Falls of the Delaware" where the City of Trenton is located. Here the river drops ten feet within half a mile and the rock-strewn rapids offer an impassable barrier tc ships. This is the "fall line" which marks the boundary between the Coastal Plain and the Piedmont Plateau. Below, the rivers ebbs and flows sluggishly through a broad terrain with low, flat horizons. Above, it passes through a changing panorama of hills, valleys, and mountains—quiet eddies with stretches of smooth water interspersed with roaring rapids and narrow chasms.

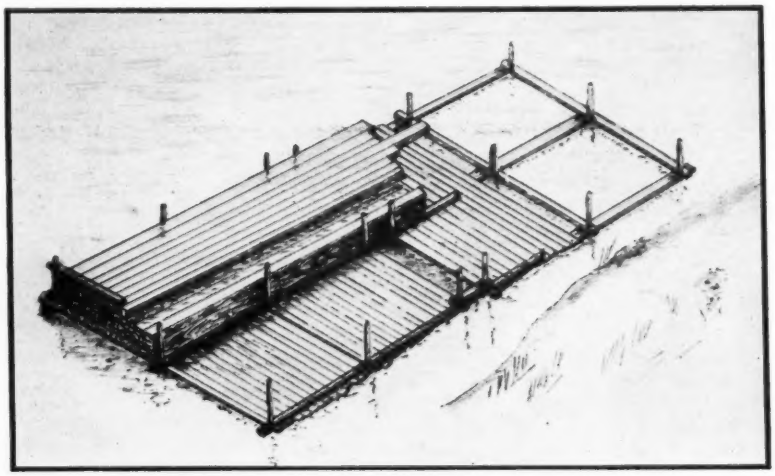
The headwaters of the Delaware lie in the rolling country of the Appalachian Plateau in southern New York. Here the virgin forest contained much white pine and hemlock in mixture with beech, birch, maple and cherry. Farther south toward Pennsylvania and New Jersey, the forest changed. Oak and chestnut appeared, with yellow poplar in the coves and pitch pine along the mountain crests. What trees there were in these primeval woods! Old records tell of mighty trunks, tall, straight and clean, often sixty feet to the first limb—boles that turned out boards two feet and more in width and without a knot. These were the forests toward which the ship yards and lumber markets of Philadelphia turned as the supplies in the lower valley dwindled.

In the early days trade was carried up and down the Delaware in canoes and, after 1723, in Durham boats, which toiled laboriously as far as Walton, New York, 300 miles above Philadelphia. The channels, rocks and rapids were thus already known and charted in 1764 when the first raft came down the river on the spring flood. Built at Cochecton Falls, New York, forty miles above the Jersey line, it was brought to Philadelphia by one Daniel Skinner and a companion. It consisted of mast-timber—six white pine poles, each seventy feet long—held together by hardwood spindles run through

Dreaded Welles Rift where many rafts met disaster during the 150 years timber and other products of the forest passed down the Delaware River to the markets of the world

holes bored in both ends, with wooden pins outside to keep the poles from slipping off. The masts were sold for four pounds apiece, and Skinner was granted the title of "Lord High Admiral of the Delaware." This marked the opening of an era of timber rafting which was to last for 150 years—until the virgin stands were gone.

Chiefly logs were rafted in the early days. These were lashed together with ironwood saplings three or four inches in diameter, laid across the logs and fastened down with wooden staples made of elm, steamed and bent to shape, placed in auger holes and wedged tight. Later, sharpened horse shoes were used as staples. The rafts ranged from sixteen to thirty-six feet in width, from 100 to 200 feet in length, and contained between 30,000 and 100,000 board feet, log scale. One oar at the bow and one at the stern were used on the smaller rafts. The largest ones carried two fore and three aft. These were mighty sweeps, forty feet long and seven inches in diameter, made preferably from basswood, although hemlock, pine and yellow poplar were also used. They were bored to hang on pins set firmly into blocks. The blades were sixteen feet in length and a foot wide and the handles were shaved down so as to be easily grasped by two or three men. The rear right hand oar was used for steering.



Lumber cribs used on the Delaware after the Revolution. A string of five cribs coupled together (two are shown above) was called a "colt," two colts a "raft," and two rafts a "fleet"

With timber coming down, sawmills began to appear, first at eddies along the main upper stream and then upon the tributaries. These mills, the primitive up and down type, were driven by water power. Here rafts were bought and the logs sawed into plank or scantling to be sold locally or re-rafted down the river. The custom was to buy a raft intact and this necessitated much hard bargaining. There were the spaces between the logs to deduct, the size of the average log to agree upon, and a rough rule-of-thumb to apply to get the approximate volume. Defects could not be checked for the raftsmen always turned their logs "fair side to London" and laid the lash poles so that poor quality was well concealed.

After the Revolution, lumber rafts became more common on the Delaware. These were made up of a series of cribs coupled one behind another. A crib was usually eighteen feet long and sixteen feet wide, and consisted of three "runners" laid lengthwise and three cross pieces. These were held together by "grubs" of ironwood saplings thrust up through auger holes at every joint, and wedged. The crib frame was "floored-in" with boards laid crosswise, which were held in place by scantling wedged down lengthwise over the "grubs." In the water one crib was fastened to another by three hornbeam couplings a foot or two in length. In loading a string of cribs, four courses of plank were first laid on lengthwise over all the raft, breaking joints for every course. These were wedged down by scantling bored to slip over the set of "grubs" at each end. Next came the "shingle" courses of lumber to a total height of three feet. More scantling or "headblocks" were wedged down over all the "grubs," crosswise of the raft. The center "grubs" at bow and stern were used as oar pins, and the raft was ready.

A string of five cribs was called a "colt," and these were used on tributaries or far up on the main stream where the channel was crooked and the going bad. As the river widened out the "colts" were put together into larger units. Two "colts," end to end, made a "raft," and two "rafts" fastened abreast were known as a "fleet" or "double raft." A single "raft" usually contained about 100,000 board feet of sawed lumber, although more was often piled on and some of the old mill records tell of rafts pulling in so heavily loaded that the decks were all awash. Beginning in 1764, rafting steadily increased until by 1830 at least a thousand rafts were coming down the Delaware each year, bringing an annual volume of some 50,000,000 feet. Most of this was white and yellow pine and hemlock from New York and Pennsylvania with smaller contributions from New Jersey. During these years sawed lumber sold for from $7.00 to $18.00 a thousand feet in Philadelphia, Pennsylvania.

Hancock, New York, at the junction of the East and West Branches, was the center of this lumber region. Beyond, far up on the West Branch, only a narrow divide separates the headwaters of the Susquehanna from those of the Delaware. The latter was the shorter route and Philadelphia a better market, so large quantities of both logs and lumber were sledded over the divide each winter from points along the Susquehanna, for rafting down the Delaware.

The men who cut the timber and ran the rafts—mostly English and Scotch-Irish with a scattering of Germans—were a hardy lot who had come to carve homes in this rough and stony land. Large families were the rule, for many hands were needed to clear the stones from fields, to sow the buckwheat and husk the corn. In the winter timber was cut and sledded to the river with oxen, while hunting and trapping pieced out the family subsistence. In the spring the ice went out, the snows melted, the river rose and the great event of the year was at hand. The "colts" were ready, the sweeps in place, the dinner box and jug of liquor aboard. "Cast off!" Hands manned

the oars and the rafts pulled out into the current.

Of the rafts starting from the headwaters most were sold along the way and relatively few of the original crews went through to Trenton or Philadelphia. For those who made this entire run in early days there was a long trip back again on foot. After the railroads came, the raftsmen used to take the train at Trenton to Jersey City, then up the Hudson by boat to Newburg, and home across the hills.

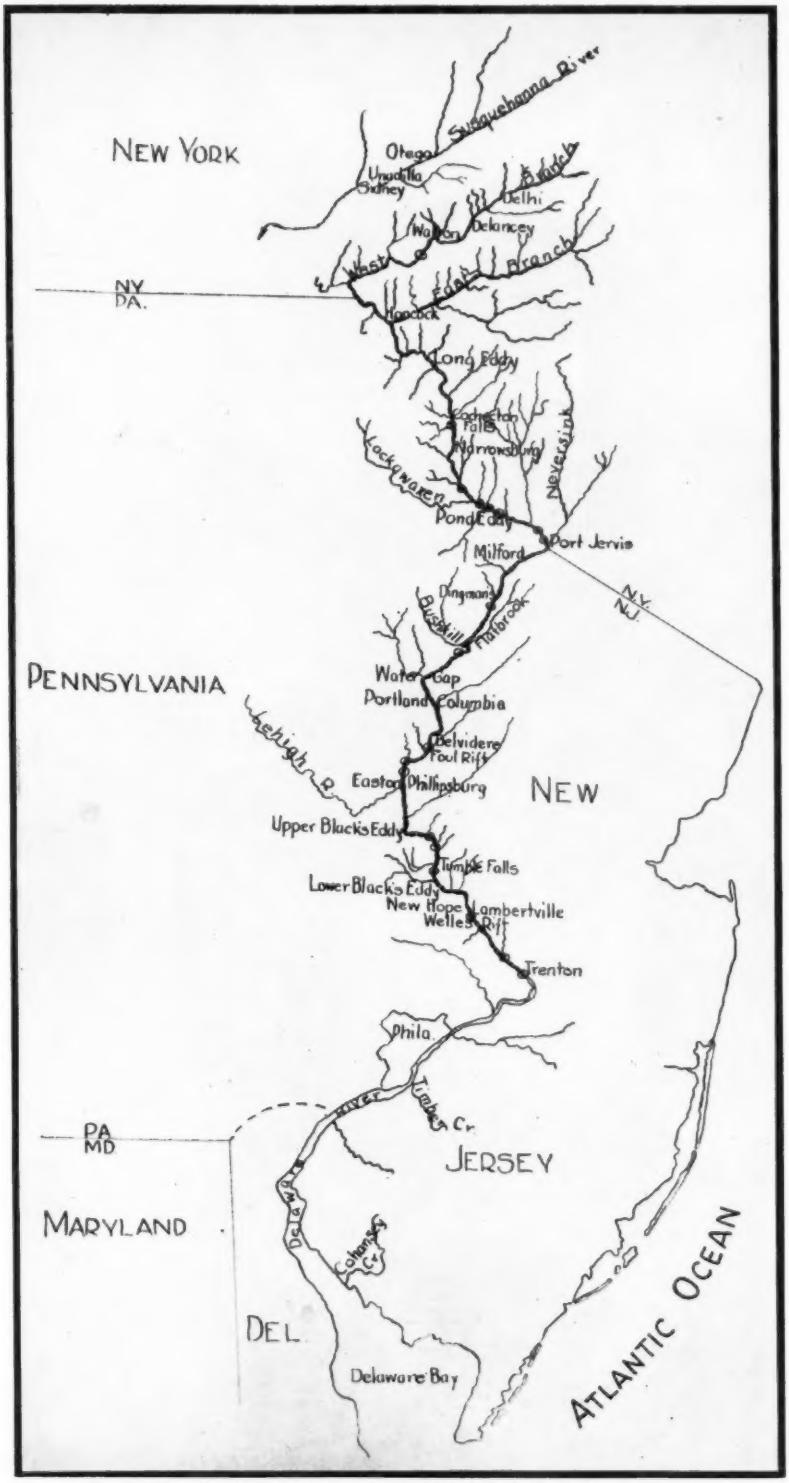
From the headwaters down, the raftsmen have left the earthy tang of their era stamped in many old place names scattered along the river. There was the "Catch-All," a sharp right-angled bend near Walton; and "Apronstring Island" and "Pull-Hair Bar," and "Nobodys." There were "Tumble Falls" and "Stairway Rift" and "Safe-and-Easy Landing"—all guide posts for the navigators. "Foul Rift" was a dreaded stretch of rushing water and jagged rocks.

High water usually came in March or April and lasted four or five weeks. During this time most of the rafts came down. Others, however, were launched on the smaller "freshes" which followed heavy summer storms, and some could be seen on their way down stream until late in the fall.

Delhi, New York, on the West Branch, was the upper limit of rafting. Here, nearly 300 miles above Philadelphia by water, the river was narrow and crooked, so that only "colts" could be used. Just below Walton extra hands were taken on to help through the stretches of bad water as far as Hancock, for here was a series of bars and rocks and "sucks" where rafts had to "keep their point" continuously to avoid piling up or running aground.

At Hancock, rafts came in each spring from both branches of the Delaware and tied up in long rows along Apronstring Island. The extra hands from Walton were paid off here and hurried back at night across the hills to bring down another raft tomorrow, for the high water must be used while it lasted.

In going down the river, rafts usually tied up along the bank as night came on, in quiet eddies where lodgings were available. In early days before ropes could be had they were moored with thirty-foot poles of yellow birch. Rafts could not always be stopped at the landing places in times of flood and sometimes the men who were put ashore to make fast, failed and had to (*Continuing on page* 542)



The "Timber River" a sixteenth century writer called the Delaware because of the "curious timber they sent in great floats to Philadelphia." Most of it was rafted from the virgin forests of pine and hemlock in the northern Appalachian Plateau and from the hardwood forests farther south

THE MOUNTAIN THAT BREATHES FIRE

Asleep for Untold Years, Mt. Lassen, in Northern California, Wakened on a May Morning in 1914 to Become the Country's Only Active Volcano

By DR. CARL R. SWARTZLOW

P. J. Thompson

The crater on Lassen Peak—only active volcano in the United States and known in Indian folklore as "the mountain that breathes fire"

SINCE the fall of Poland and France under the sudden and devastating attack of the German armed forces, we have become very familiar with a new word. It is the word, "Blitzkrieg." Yet nothing conceived by the brain of man can be so totally devastating, so irresistible and so sudden as the destructiveness of nature. In human warfare there is always some warning of impending danger—the throb of the bomber's motor or the knowledge of the enemy's whereabouts. Nature, on the other hand, seldom gives man an inkling of what unusual event is about to take place.

Nature's Blitzkriegs are tornadoes, hurricanes, earthquakes, and volcanic eruptions. Man often has some warning of impending hurricanes, but no device has been invented to predict with certainty the imminence of earthquakes or volcanic explosions. The fate of Pompeii, Herculaneum, Lisbon, Messina, St. Pierre and the recent earthquakes in Turkey, Chile, Peru, and California cause man to ponder the cause and effect of this sudden devastating force.

When the devastation occurs in populated areas the scars of destruction are soon healed by the removal of debris and the erection of new buildings. However, when nature's Blitzkrieg strikes in isolated, sparsely inhabited areas, centuries may pass before the evidences of destruction are obliterated.

The only place in the United States where the relatively unhealed scars of volcanic devastation are still visible is in Lassen Volcanic National Park in northern California. Here, twenty-seven years ago, Lassen Peak climaxed its recent activity by laying waste nearly three square miles of forest and meadow. But first, let us provide a setting for these events.

Lassen Peak, rising 10,453 feet above the sea, is the southernmost peak in the Cascade Range. This whole range is volcanic in origin and its many peaks were once active volcanoes. Lassen Peak, however, had been dormant for an untold number of years prior to 1914. Local Indians called the peak "the mountain that breathes fire," indicating that their forefathers had seen it in eruption and passed this information on in folklore. It remained for the year 1914 to produce proof that the native Indians had actually named the mountain correctly.

On May 30 of that year some residents of the village of Chester noticed a dark cloud rising from the summit of Lassen. Although the mountain was generally known to be a volcano an eruption was farthest from the minds

of the observers. Yet this explanation for the dark cloud was the only feasible one. These men requested the local United States Forest Service ranger to investigate, and, as a result, their suspicions were confirmed. Lassen Peak is authentically known to be the only active volcano in continental United States.

After this initial outburst, the mountain continued in intermittent activity and during the remainder of the year 110 eruptions were recorded. The frequency and violence of the eruptions had increased throughout 1914 and the early months of 1915 and culminated in the spectacular activity of May 19 and 22 of that year. Heretofore, flashes of fire had been reported but the actual presence of incandescent material could not be proved. However, on the evening of May 19 observers noted glowing masses tumbling down the west side of the peak. When morning dawned, the observers noticed that a long black tongue of lava had rolled down the western slope for a distance of about 1,000 feet.

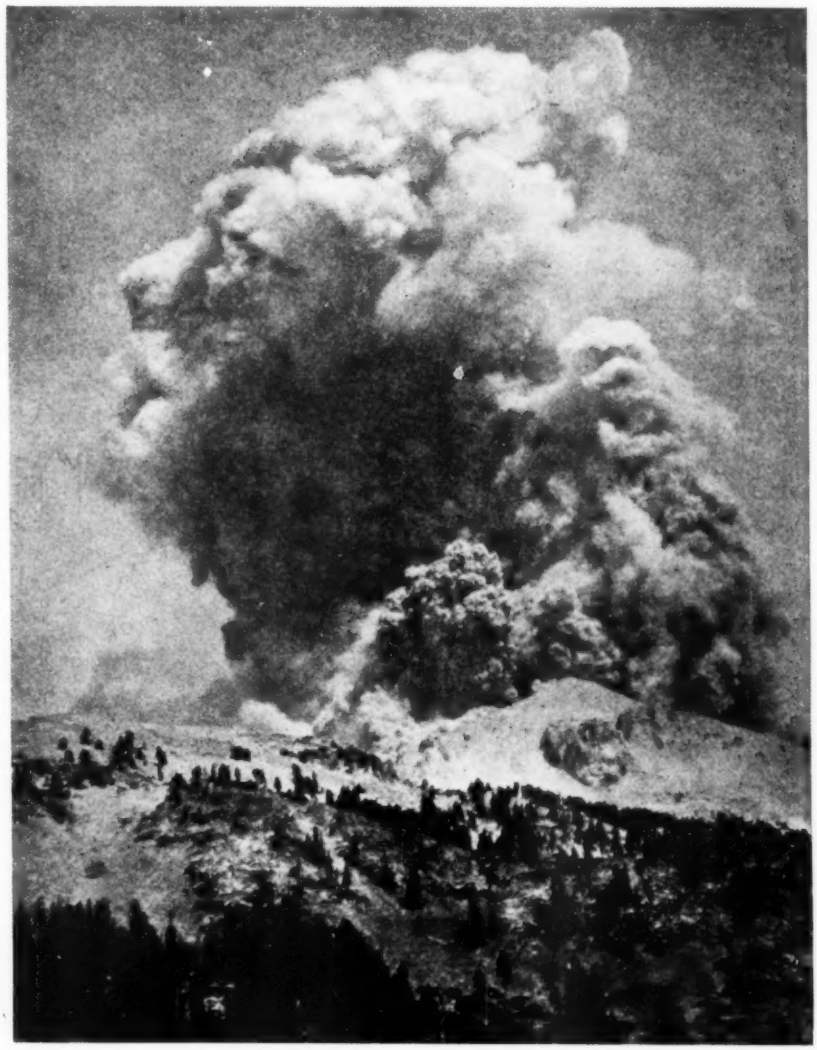
The sight of this lava mass was a thrilling spectacle, but it was as nothing compared to what had occurred on the opposite or eastern side of the mountain. A small amount of lava had filled a notch on the eastern crater rim and rolled down the mountain about 150 feet. The snow pack on the east side of Lassen is always heavy, but the winter of 1914-15 was exceptionally severe and the snow had accumulated to a depth of from thirty-five to forty-five feet. When the hot lava and volcanic gases were expelled, a great portion of this snow pack was immediately converted into water which rushed down the side of the mountain. Volcanic dust, rock fragments and forest debris were churned with the water into a heavy mud that swept a path 500 yards wide through the forested lower slopes.

The mud flow, for such it was, descended the mountain and split, part of the flow entering directly into Hat Creek Valley and part into Lost Creek Valley. Its momentum and destructiveness did not abate until the flow had traversed eighteen miles of Hat Creek Valley. Fortunately no human lives were lost, but several ranch homes were destroyed and much meadow land was ruined by the litter of rocks and logs that were deposited.

The destructiveness of the mud flow was sudden and spectacular but nature had a further surprise attack scheduled for May 22. As stated above, on May 19 a mass of lava rose in the crater. This lava was stiff and solidified almost as soon as it reached the surface. It acted as a stopper which plugged the throat of the volcano. As a result, the volcanic gases accumulated beneath until enough pressure developed to force a passage through the lava plug. This happened on the afternon of May 22. A gigantic cloud of steam and dust rose about 30,000 feet in the air and was visible for hundreds of miles.

Although much of the gas rose vertically, another blast was traveling down the east side following nearly the same path as that of the mud flow but extending over a greater width. The force of the blast was so terrific that trees four feet in diameter and three miles away from the mountain were snapped off like toothpicks. Hundreds of forest giants were knocked down with their tops all pointing away from Lassen Peak and their trunks parallel. The bark of every tree was blasted away on the side that faced the mountain.

The completeness of the destruction staggers the imagination. An area of approximately three square miles completely denuded of every living thing within an hour's time makes the efforts of (*Continuing on page* 542)



Awesome and spectacular was the eruption of Lassen in 1914 —the very head of Vulcan himself appearing in the outburst of smoke, steam and gas from the crater's mouth

THE WAR AND FINNISH FORESTRY

By YRJO ILVESSALO

MORE than any other country Finland has had to build up her economy with the aid of her forests. This is because Finland possesses relatively few natural resources except abundant forests. Fortunately the exploitation of her forests has been easy, due to good natural conditions, a wealth of waterways suited to timber transport branching out in every direction, and to a suitable system of railways and roads.

The tremendous economic development which characterizes Finnish independence from the year 1918 onward, was based to a large degree on the forests. The country's woodlands were able to supply the raw material needed for the development of Finnish forest industries and at the same time to supply the domestic demand for wood in the northern part of the country. Freed from alien guardianship, the nation was able to manage its forests so that its forest resources remained unimpaired, as was proved by the forest inventories carried out during the years 1921-24 and 1936-38.

In 1938 all signs still pointed to a continuation of the upward curve of development, based on forest exploitation, to as high a state of material and cultural prosperity as dwellers in the far north can reasonably expect. The Great War that broke out in that year shattered these visions of the future.

The devastation of war and Russia's dictated peace of 1940 have made great inroads into Finland's forests which form a lifeline of her national economy. Here is shown a sample of a Finnish forest of pine and spruce as photographed before the war. According to the author, it has since been partially destroyed by the Russians

The Baltic Sea, the route by which forest products reached the American and world markets in considerable volume, was cut off from all connection with the North Sea and Atlantic Ocean. An attempt was made to compensate in part by developing the route from the ice-free harbour of Petsamo at the northern tip of Finland. But whereas the distance from the industries in South Finland to the nearest port had never been more than a few dozen or at most a hundred or two miles, these enterprises were now faced with railway transport up to 600 miles to the terminus of the railway and then a further distance of 300 miles by road along the Great Arctic Highway. Nevertheless, in spite of the difficulties and expense, this transport route, especially important for trade with America, was doggedly kept open until Great Britain finally closed it.

Each successive year of the war diminished still further Finland's opportunities for exporting forest products, which in normal years provided eighty to eighty-five per cent of Finland's total receipts from exports. In the best years these amounted to as much as 700 million Finnish marks or 155 million dollars at pre-war rates of exchange. The restriction of exports to buyer countries facing the Baltic, and to some small extent through them to adjacent countries, paralysed the forest industries. Available storage space soon filled with sawn timber, cellulose, paper and plywood, and forest industries and forestry were seriously threatened.

At the same time, however, factors appeared which increased the domestic consumption of wood and brought about great changes in the exploitation of the forests and the output of forest products.

The first of these factors was the increased difficulty of importing foreign fuels—coal, coke and motor fuels. In the pre-war period industry, transport and the cities used coal and coke, of which Finland herself has none, to the extent of from one and a half to two million tons

annually, and liquid fuel imports amounted to approximately 200,000 tons. These fuels had now largely to be replaced by domestic products—coal and coke by wood fuel, motor fuel by charcoal and wood chips. It became necessary to organize cuttings for wood fuel and charcoal wherever transport costs were low enough. The increased prices of these products made forest owners generally willing to cut and all forest owners were exhorted to cut a certain minimum quantity. Indeed, a law was enacted making cutting of fuel wood compulsory, though no need appeared to apply this law.

Upper—Part of a forest in East Carelia, damaged by shells and subsequent forest fires. Lower—In the Kollaanjoki district, famous for the successful defense put up there by the Finns, little remains of the formerly heavy timber, and the thick snow hides the shattered, fallen trunks

Thus while cuttings intended to provide raw materials for lumber, paper and plywood industries greatly declined, the cutting of fuel and charcoal wood increased fifty per cent and accounted for the greater part of the quantity of timber felled. The character of the cuttings altered accordingly, most of them being thinnings yielding low grade wood for fuel. Efforts have been made to guide forest-owners in this respect in order to conserve valuable industrial material for the post war market. Rightly carried out, cuttings for fuel purposes have brought about an appreciable improvement in the silvicultural condition of the forests.

The heaviest blow to Finland's forests, forestry and forest industries came when Finland herself became involved in hostilities in the defensive war of 1939-40 that followed a Soviet invasion and ended in the dictated Peace of Moscow. The severe peace terms dictated by the Soviet Union robbed Finland of 8,200,000 acres of land, of which 6,300,000 acres were forest land. The loss denoted a reduction of 5,968 million cubic feet in the total growing stock of the Finnish forests, and a reduction of 162 million cubic feet in the annual growth. This great loss, as matters turned out, fell very largely upon the forest industries and export trade, for the entire population of the lost territory, 458,000 people, moved out of the ceded area into the rest of Finland. The domestic consumption of wood could therefore be expected to continue largely unaltered, and it would have to be met out of Finland's reduced forest resources. The Finnish forest industries had already been weakened by the circumstance that a great number of the best and biggest cellulose mills, sawmills, plywood factories and other wood-refining enterprises were situated in the ceded territory.

The Peace of Moscow did more, however, than reduce Finland's forest resources. The new frontier cut across waters, canals, railways and roads in a manner that made

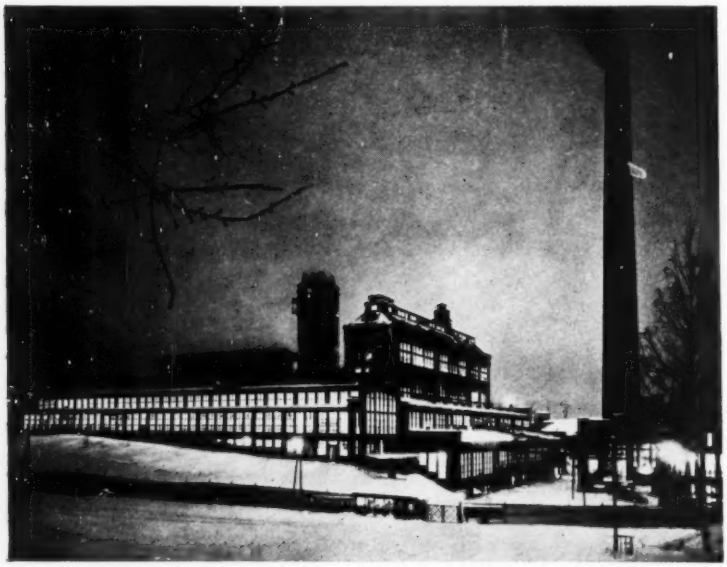
To provide homes for the thousands of Finns evacuated from territory ceded to Russia, the extensive manufacture of standardized, small wooden buildings became necessary

the transport of timber extremely difficult over wide areas in the new frontier regions. For instance the Saimaa Canal, especially important for the transportation of timber in that it constituted an outlet to the sea for eleven and one-half million acres of forest in the Lake Saimaa region, was closed by the new frontier, and all transport via the canal was prohibited by the Russians. The losses inflicted on Finland's forestry were thus much larger than the direct loss of forest resources.

The migration of the population of the ceded territory into the remaining Finnish area also had appreciable consequences for forestry. In the ceded territory there were about 36,000 farms, whose owners had to be provided with new farms elsewhere in Finland. A rapid colonization law was enacted to provide these farms. The land needed was to be taken from State, municipal, church and private owners either by voluntary sale or requisition. As sufficient forest for purposes of domestic consumption had to be attached to these new farms, it meant that about two million acres of woodland was to change hands and be formed into small forests. Many forest-owners had to surrender so large a part of their forests that their former working plans had to be entirely revised. Even in this way, however, it was impossible to make up for the forest losses sustained by farmers from the ceded territory, for the total area of private forest belonging to farms in the ceded territory was over three million acres.

The rapid creation of 36,000 new farms also called for a speedy supply of enormous quantities of building timber, as farm buildings in Finland are mostly of wood. Many millions of logs and great quantities of boards and other sawn timber were needed. Several woodworking enterprises embarked on the extensive manufacture of standardized wooden buildings for this purpose, and for repairing homes damaged by the war. These building schemes will doubtless greatly influence Finland's forestry and the Finnish forest industries.

In a forest country fighting takes place in war-time chiefly in the forests, where defensive positions and lines of defense are built. This applies to Finland. Over wide areas forests have been destroyed and been burned by the enemy. In addition the frontier, which in the east runs for a length of at least 600 miles through forest, has demanded the treatment of a broad forest zone on anything but silvicultural lines.



These are pulp mills at Enso, in territory ceded by Finland to Russia in 1940. Retaken by the Finns recently, the mills are reported to have been blown up by the Russians before they left

The above brief references suffice to show that the Great War and above all Finland's own war have had extensive and far-reaching effects on Finland's forestry. It has not been allowed to develop in peace along the lines that had been created during the past twenty years, which gave the brightest hopes for the future. The new war that broke out some weeks ago with the same menacing enemy will have further consequences for forestry. The belief is firm in Finland, however, that this latest unavoidable war, excessive as are the sacrifices which it demands of a small nation, when fought out stubbornly to the end will bring a peace that to some extent will alleviate the misfortunes brought by the previous war, and again open for forestry a path of strenuous but peaceful labor to a new prosperity.

FORESTRY TRAIN TOURS THE SOUTHEAST

By CHARLES A. GILLETT

THE FIRST all-forestry demonstration train to tour the Southeastern States has completed its fifty stop schedule. This train, operated by the Seaboard Air Line Railway in cooperation with the United States Forest Service, state forestry departments, state extension foresters, and the various state forestry associations, began its schedule on August 23 at Clinton, South Carolina, and continued in operation through October 25. Over 50,000 people had opportunity to view the exhibits in South Carolina, North Carolina, Georgia, Florida, Alabama, and Virginia.

The demonstrations were intended to show the dependence of people on productive forests. The three-car display of illustrations and models of forest stands was designed to encourage the private owner to give his woodlands proper protection and to cut his timber wisely. It was also designed to impress the general public with the benefits and wide use of forest products.

The first car was built around the theme, "The South's Forest Resources Are Vital to Everyone's Welfare," and the displays revealed how and why forests are essential to all groups of people. A series of illustrations in color and various collections of forest products arranged against a forested background showed how the forests affect the welfare of workmen, farmers, housewives, businessmen, sportsmen, communities, and school children.

The section relating to workmen emphasized the opportunities for employment which the forest affords and saws, hammers, shovels, planes, rules, and other items called attention to the fact that the forest also provides the tools with which to work. The community section with municipal watersheds, industries, churches, schools, and its family groups further emphasized the dependence of man on products of the forest. Businessmen were reminded that forests furnish raw materials that keep wheels of industry turning; farmers were reminded that they can help defend their country by defending their trees when they realize that productive farm woodlands are part insurance against factories blighted with idleness and people haunted with want; sportsmen and recreationists were reminded that they are partly dependent upon forest resources for fishing, hunting, swimming, and other leisure-time activities.

The second car depicted in one scene the waste and devastation caused by uncontrolled forest fire and poor cutting practices. Another scene of green, productive forest showed the effects of proper fire protection. The young trees and the loads of forest products on the way to market illustrated the logic of these proper practices. An illuminated display board urged state-wide protection and reminded the individual what he or she could do to help. As the first car stressed the benefits and services of the forest, the second carried the thought that to enjoy forest benefits and services, forests must have care.

The third car, fitted up as a motion picture theatre, permitted educational forestry films to be shown while the train was on exhibition. In addition to the industrial forester of the Seaboard Railway, other foresters accompanied the train and consulted with landowners and farmers concerning their forestry problems.

The entire exhibit showed uncontrolled forest fire as a destroyer of resources which must be vigorously dealt with in order to conserve the resource foundation under our farms and factories. It showed that in addition to the staggering monetary loss, forest fire can disrupt whole communities, industries, and transportation systems. It was a reminder that should impress the public with the immediate need of forest fire prevention.

More than fifty thousand people—workmen, farmers, businessmen, housewives, sportsmen, school children — viewed the Seaboard forestry demonstration train during its fifty stops in six Southern states

DO JUVENILE FORESTRY CAMPS PAY?

Seventy-five out of every hundred boys committed to the Los Angeles juvenile delinquency forestry camps have been rehabilitated

Yes, Say Los Angeles County Officials, After Nine-Year Experiment in Forest Protection and Youth Rehabilitation

By LESLIE S. PERCEY

Photographs by Los Angeles Department of County Forester and Fire Warden

JUVENILE delinquency and the prevention of crime among youth may seem pretty far removed from the field of forestry. Yet out in Los Angeles County, California, the two have been brought together in a project that is as successful as it is unusual.

One afternoon about ten years ago, Superior Judge Samuel R. Blake, then presiding over the Juvenile Court of Los Angeles County, sat in his chambers pondering over a most perplexing situation. It had to do with from 300 to 400 transient boys arriving weekly in the county from all sections of the country. The practice at the time was to round them up, place them on a train, and send them back to their legal residences. But this practice was not successful. It did not solve the problems involved, either for the boys or for the county. For one thing, it was expensive for the taxpayers, for the county paid the boys' railroad fares back home. Then not infrequently they would drop off the train before reaching their destination and return by devious ways to Los Angeles. Many who did return home would assemble their old associates, recite the pleasures of a transcontinental train ride at the expense of Los Angeles County, and in general incite others to follow in their footsteps. Large numbers of boys were thus sent thumbing their way across the continent for the free return railroad ticket that awaited them in Los Angeles.

Not all of the boys, of course, made the roundtrip on schedule. Some ran into trouble and were cited before Judge Blake's Juvenile Court and committed to the Preston School of Industry for periods of from fourteen to eighteen months. This was usually an effective stop to their excursions but it did not relieve the burden of expense placed on the taxpayers of Los Angeles County, or of the state. It cost them around sixty dollars a month for each boy so confined. This was real money. Moreover, by sending transient boys to the Preston School of Industry the county was utilizing beds and space needed for local juvenile offenders.

Judge Blake became convinced that the transient delinquency boy problem could be largely solved by committing the boys to camps under proper management. Acting upon this idea he conferred with the chief probation officer and they reached the conclusion that the only county department in a position to offer the desired cooperation was the Department of Forester and Fire Warden. The county forester was then called in and after numerous conferences it was decided to experiment by establishing a thirty-boy camp near the entrance of San Dimas Canyon.

The policy under which this experiment was made provided that the boys should engage in useful forestry protection work, thereby rendering a distinct service to the taxpayers. It was decided that the Juvenile Court should commit to the camp only those cases which could best be rehabilitated by that type of program. The County Probation Department, being the court's representative, assumed responsibility for all matters pertaining to the welfare, education and recreation of the boys. The Department of Forester and Fire Warden, under the county forester, assumed responsibility for maintenance of the camp and the work projects. It was further decided that the camp should not be run as an institution, that there should be no armed guards, no guns, no iron bars. The boys would be committed to the camp strictly on their honor and as a business transaction between them and the court—the court being the committing agency and the boys being required to pay their debt to society. A wage of fifty cents a day was set up to be accumulated to pay for eventual transportation of the boys to their legal residences, to purchase clothes, and to provide a few extra dollars for expenses during the trip back home.

The plan was then placed before the County Board of Supervisors which, after due consideration, authorized establishment of the camp and appropriated the necessary funds. The first camp for thirty boys was opened in February, 1932. It proved to be so successful that the following year the Board of Supervisors authorized

its continuance and, furthermore, increased appropriations to provide for an additional thirty boys, or a total of sixty.

Changes in camp policy were likewise made in 1933. For one thing, the Federal Transient Service entered the field. Then the Juvenile Court inaugurated a policy of committing local boy offenders to the camp along with the transients. As a result of this success in handling the juvenile delinquency problem, and upon recommendations of several county grand juries, the number of camps have since been increased to three with a total capacity of 210 boys.

Administration of the camps is the dual responsibility of the county forester and the chief probation officer. For each camp the forester's staff consists of a camp superintendent and from four to six foremen, two cooks and an assistant cook. The probation staff includes a probation officer in charge and from seven to nine assistants.

The whole program covering work and none-work periods is conducted on the merit system and the boy is marked each day according to his industry, cooperation, adaptability, affability and numerous other factors. Merits or demerits of one day are not carried over to the next except for arriving at a weekly average. The positions of janitor and laundry boy are privileged jobs to be sought through maintaining a high merit standard. A position on the forest fire crew is one of particular distinction and is considered a real attainment. The whole program is based on the dignity of industry and the boy considers it an honor to be classed as a good worker. There are other things to be sought through the maintenance of high merit standards. Motion pictures, swimming and baseball are only for those boys who have received high marks.

The camps are rendering invaluable service to the county by helping solve the forester's maintenance problem. The Department of Forester and Fire Warden has under its jurisdiction over 300 miles of motorways and fire roads, 150 miles of firebreaks, 200 fire suppression water tanks, and numerous other fire protection facilities and camp grounds and picnic areas that must be kept in service. Without these camps it would be necessary to resort to the hiring of day laborers to do the work, which would cost the taxpayers far more than the cost of operating the camps. Moreover, the national defense industries in the Los Angeles region are requiring the services of practically all able-bodied men, and it must not be overlooked that the protection of the county's watershed areas is a necessary part of the national defense plan. Therefore, the camps are invaluable from a protection standpoint, to say nothing of the rehabilitation of the boys themselves and the value of this accomplishment to society and

Forest fire protection is the boys' big job. Here the purpose and function of a firebreak are being explained by their foreman

All boys are given intensive training in forest fire suppression. Trained foresters demonstrate the technique of laying a hose line

To belong to a camp fire-fighting crew is considered a real honor. Here the boys learn how to handle the business end of a hose

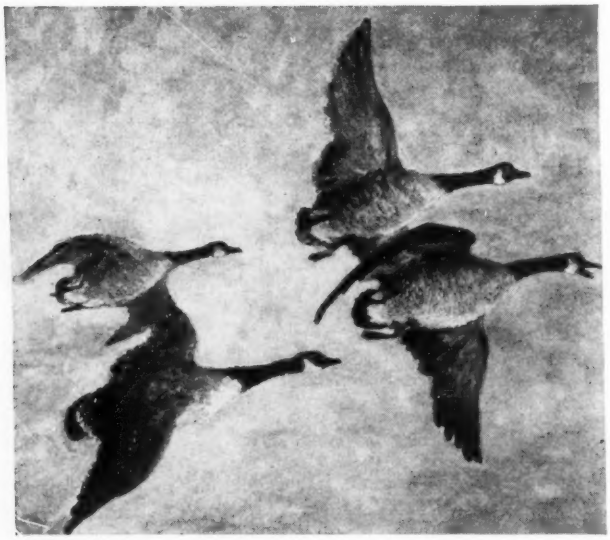
the community. The cost of maintaining a boy in camp, except for supervision and overhead, is about $1.43 a day, which includes meals, clothing, first aid, housing, and fifty cents for his services. Meals cost about fifty-four cents a day. Based on studies made, it is conservatively estimated that the local taxpayers have been saved $500,000 since the inception of the camps.

The boys are called out at 6 A. M. except on Sundays, and after morning assembly and a flag raising ceremony, gather for breakfast, which is served in family style. At 7:30 they start on an eight-hour work day—constructing and maintaining fire motorways, firebreaks, trails, fire water tanks and other fire protection facilities. A qualified foreman is in charge of each crew and a probation officer also accompanies each unit. Noon lunch is served on the job and usually consists of sandwiches, fruit, and hot or cold beverage. After a day's work the boys bathe, put on clean clothes and following a brief rest period assemble for retreat during which the salute to the flag is given. Then comes the evening meal of wholesome food in good variety, served also in family style. This is followed by a recreation period and study at the camp school.

In the course of a week the average boy will put in forty-four hours on work projects, including camp maintenance and attendant activities. To round out the program the average boy also will spend twelve hours each week in organized outdoor athletics, eight hours in school, a few hours reading, and several hours keeping himself and his portion of the dormitory clean and orderly. He will see several educational motion pictures in camp, participate in the publication of a camp newspaper, take part in community entertainment on Saturday nights, and attend church on Sunday.

Cooperation on the part of the participating agencies has been one of the reasons for the success of these camps. During the nine years they have been in operation no problem has arisen that could not be solved by round table discussion. Judge Blake and his successors, Judge W. Turney Fox and Judge Robert H. Scott, have contributed largely to the success of the program by their selection of the proper types of boys. To the chief probation officer, Karl Holton, to County Forester Spence D. Turner, and to the camp staffs, has rested the responsibility for the effective operation of the camps. Up to the present time, more than 2,700 boys have been committed to the camps for a period of about 120 days each. A study now being made by the County Probation Department indicates that seventy-five per cent of the boys committed to the camps are rehabilitated and never again come to the attention of the juvenile court.

Thus it would seem that juvenile forestry camps pay well indeed when properly organized and conducted.



OUR HERITAGE

This is our due and this our heritage:
The Autumn V of wings against the air,
The antelope who graze among the sage.
If no wild heart had sanctuary there
How bare the mountain solitude would seem!
We who remember pigeons like a cloud
As long ago and lost as in a dream,
And bison making thunder deep and loud
Upon the prairies with their pounding feet,
Will treasure every glimpse the forests yield
Of shy wild creatures, beautiful and fleet.
We cannot spare one bird song from the field!

—Inez George Gridley.

EDITORIAL

MEETING A POST-WAR NEED

IN THIS column last month, it was proposed that now is the time for conservation agencies to come together and jointly work out plans for the development of post-defense works for the conservation of soil, water, forests, and wildlife. It was emphasized that the productive use of the labor potential available when peace comes demands a common plan of action presenting a bold and physically vast conception of the nation's conservation needs, the principles to obtain for years to come. Comment on the editorial has raised the question—What steps can be taken now to activate a common plan of action?

The first of these steps, we suggest, can be the organization by the interested agencies of a central, competent group charged with the undivided duty of planning the post-defense program. The representatives should, of course, be chosen for their functional knowledge; they should not be chosen with the thought of service as representatives of the federal, state or private organizations from which they may be drafted. This is the first step—a form of organization that has already been created by many great corporations looking ahead to the readjustment to follow the present period of defense economy.

The second step is an inventory and critical evaluation by the group of the conservation programs undertaken since 1933. And this because since that year and during the eight years following funds and labor have been made available far in excess of the entire budgets made available during the whole previous history of organized conservation, the C.C.C. alone expending more than two billion dollars. The great scale of the expenditures of funds and labor during those years affords experiences to shape and guide a post-defense conservation program, a program that may well involve great expenditures, extending over a longer period of time. It is essential to determine in what respects and to what extent each of the programs and major projects undertaken during this time have been of productive utility, contributing significantly and lastingly to the national economy. In what respects have the programs been deficient, unproductive, ill-advised or guarantees of maintenance unfulfilled? There may have been, because of unpreparedness, some excuse for "boon-doggling" projects in 1933. There should be none in 1943 if that is to be the year of grace.

The post-defense program of conservation will need to be far more than a catalog of unrelated works to be carried out by agencies competing for funds and labor; and something more than an expedient for the relief of the unemployed, however emergent the necessity. Out of the evaluation studies, there should be formulated, in agreement with the conservation agencies, the policies and principles to govern the character and classes of the works to be undertaken, their priorities, and their relation to the reconstruction programs now envisaged by the National Resources Planning Board, and other public bodies and authorities.

These policies and principles should be drafted with the conviction and the determination that the conservation of our soils, waters, and forests, shall make an effective and lasting contribution to the post-defense economy. This approach calls not merely for the conventional schedules of public works so generally resorted to in periods of depression; it must contemplate the future in terms of changing social environment through urban and rural reconstruction. Marked changes are forecast in areas now socially static, affording not only the stimulus of direct employment on works of improvement, but in turn markets for manufactured materials and agricultural products for the building of permanent enterprise.

Conservation in the depression years commanded a great volume of labor that was not a charge against the budgets of the beneficiary agencies. This permitted the undertaking of projects that were not always put to the test of economic justification. Labor will again be available but the conservation projects on which it may be employed must be of such potentially productive utility that public support can be obtained and maintained. It is to be expected in the difficult period of economic and social readjustment ahead that the public will demand measures that will subordinate the expedients of relief programs that characterized the depression years. The plans now outlined for urban and rural reconstruction look to the initiation of a self-sustaining economy. The opportunity is given to the conservation agencies to participate in the making of these plans for a more productive manner of living, remembering that it is only upon a sound economic basis that the conservation of our soils, waters and forests can contribute effectively and lastingly to the national economy to follow the conclusion of peace.

ASPEN

***Populus tremuloides*, Michaux**

BY G. H. COLLINGWOOD

FROM Labrador and the southern shores of Hudson Bay, northwest to the valley of the Yukon within the Arctic Circle in Alaska, south through the mountains into northern Mexico and Lower California, scattering across the northern plains states, and more dense from northeastern Missouri and northwestern Nebraska to New England and the Southern Appalachians, grows the white trunked, fluttering-leaved aspen. It thrives on moist sandy soils and gravelly hillsides from sea level to elevations over 10,000 feet in the California mountains.

Aspen frequently reaches forty or fifty feet in height and eighteen to twenty inches in diameter, but in the southern Rockies it attains one hundred feet with diameters up to three feet. It matures at sixty or seventy years, and seldom lives beyond eighty years. Inability to withstand heavy shade causes rapid thinning of dense young stands, but except as man interferes, aspen usually maintains its ground against all coniferous competition.

Aspen lifts its narrow, round-topped crown of shimmering leaves forty feet or higher

It is a true poplar of the family *Salicaceae*, and the genus *Populus*. Of eleven members of the poplar or cottonwood group found in the United States, *tremuloides* is distinguished by almost incessant trembling of the small broadly egg-shaped leaves, whose slender,

Arthur Upson

In winter aspen reveals its central stem of blotched white supporting innumerable slender, reddish brown twigs

one and a half to three inch long stems are pinched flat from the sides. Each leaf ends abruptly in a short point, is two to three inches broad and edged with small regular teeth. The upper surface is shiny green and the back a pale dull green. In autumn the

leaves turn golden yellow some days before dropping.

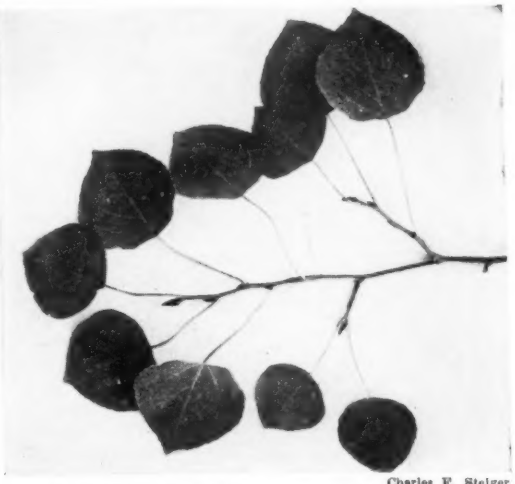
Staminate and pistillate flowers appear as drooping gray catkins, the two sexes being on different trees, and the seeds maturing before the leaves are fully formed. The fruit is about four inches long, and composed of many light green capsules like quarter inch long Indian clubs. Packed within each capsule, the tiny brown seeds are so small that two million scarcely make a pound.

The yellowish green or nearly white powdery bark of young trunks and branches is marked with dark scars. Bark near the base of old trees is nearly black, one or two inches thick, roughened by bands of wart-like growths and divided into flat ridges. Branchlets are red-brown and shining, roughened by large elevated leaf scars, and they gradually turn dark gray.

The soft, close-grained light brown heartwood merges into a broad band of nearly white sapwood. A cubic foot when air dry weighs about twenty-five pounds. Aspen wood is used for paper pulp, boxes, excelsior, matches, and small quantities for furniture and vehicle parts. Several million board feet are cut annually, but no separate record is kept of lumber cut.

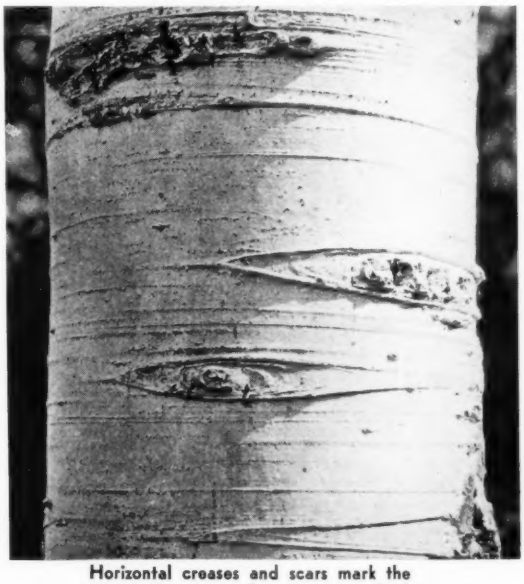
Aspen is so subject to heart rot that many trees are useless before reaching fifty years. Fungus often enters through fire scars as well as in tunnels cut by aspen borers.

Aspen is easily killed by fire, but its vigorous sprouting permits it to return quickly. Seeds travel long distances on the wind, germinate quickly in moist soil bared by fire, and the small plants which grow rapidly in exposed situations help prevent soil washing.

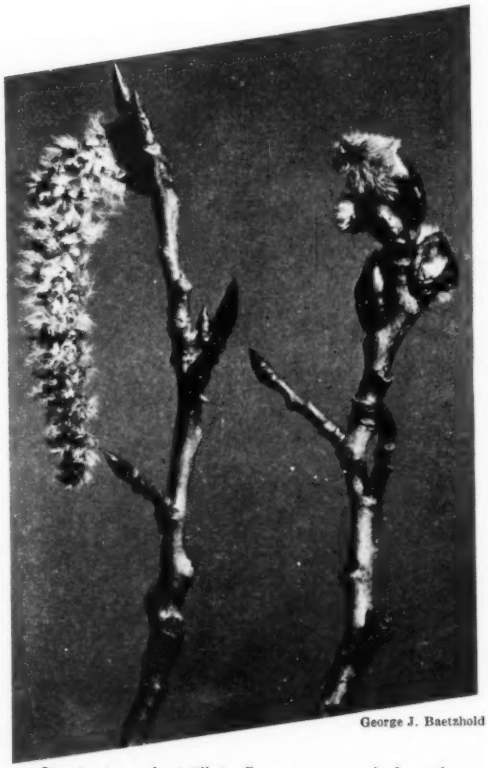


Charles F. Steiger

The one-and-a-half to two-inch, dark green leaves are attached by narrow, ribbon-like stems



Horizontal creases and scars mark the thin white or yellowish green bark



George J. Baetzhold

Staminate and pistillate flowers appear before the leaves as drooping catkins, and on different trees

Natural range of Aspen

AFA Board Further Defines Position on Forestry Bills

AT its fall meeting on September 22, the Board of Directors of The American Forestry Association approved a report of its forestry committee further defining the position of the Association in respect to certain forestry legislation now pending. The Committee's report dealt primarily with the questions of public regulation, public acquisition and forest protection as involved in several bills now pending in Congress. The sections of the Committee's report as approved and adopted by the Board follow:

"Public Regulation. — The committee recommends that the Association reaffirm its stand in favor of state regulation of cutting on privately owned forest lands as expressed in the resolution on this subject adopted October 20, 1939. This would mean that the Association cannot give its support to the two Pierce bills (H. R. 3849 and H. R. 3850), which provide either directly or indirectly for federal control. In view, however, of the current extensive discussion of regulation and of the widespread public interest in the subject, the committee believes that some amplification of the Association's position would be appropriate at this time. For this purpose it recommends the adoption of the following statement:

"Continuous access to ample supplies of natural resources is essential for the permanent well-being of any country. Since such resources are the foundation of national prosperity, the interest of the entire community in their management is paramount even to that of the private owner. Exceptionally blessed by nature with an abundance of agricultural, forest, range, and mineral lands, the people of the United States can continue to make these resources available for their own use and for the use of other nations only as they make adequate provision for the perpetuation of those which are renewable and the prudent harvesting of those which are not.

"With respect to forests, which are among the most important of these resources The American Forestry Association believes that the need is urgent for a joint program of action between private owners, State governments, and the federal government to raise present standards of management. While such a program should include some extension of public ownership and the more intensive handling of public forests, its main concern will necessarily be with the three-fourths of our forest land area now in private ownership.

"Although more and more owners are adopting satisfactory forest practices, there is evident need here, as in many other phases of private enterprise, for the exercise of sufficient social control over the less progressive owners to safeguard the public interest in an indispensable resource. This interest requires that all forest lands not better suited for some other use be kept in a productive condition and that increasingly effective practices be adopted as their feasibility is demonstrated. Plans of management for individual tracts, which might often advantageously be worked out in consultation between their owners and representatives of the public, would be an effective means of achieving this objective.

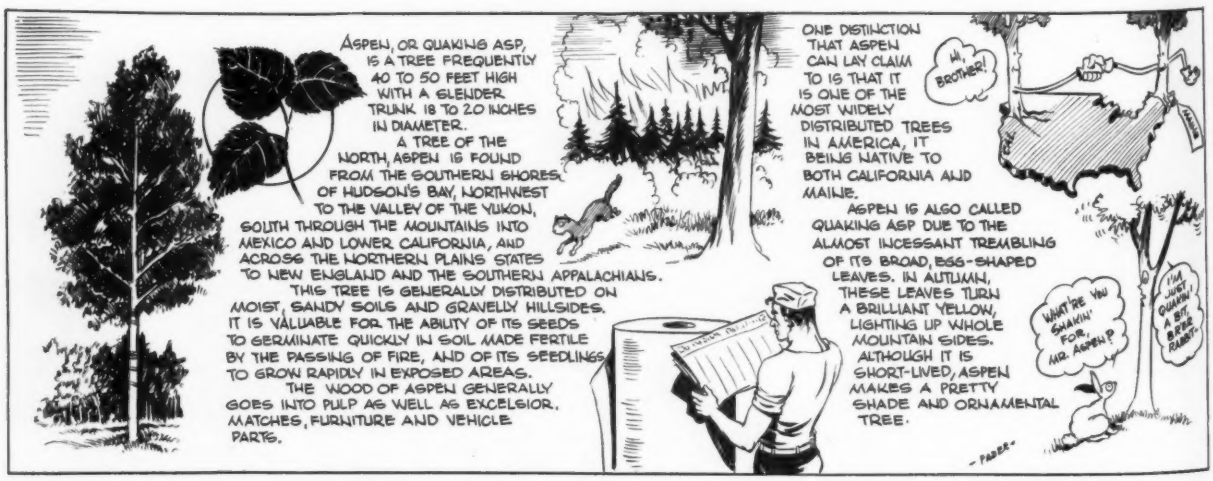
"The American Forestry Association believes that the social control which it proposes should be exercised by the states, with ample opportunity for the participation of private forest owners and acceptance of proven methods of forest practice as developed and applied by forest owners. At the same time the interest of the entire nation is so directly affected by the way in which the forests are handled as to make federal participation an essential part of the program. In the judgment of the Association this participation can best take the form of liberal financial contributions to states which enact and enforce legislation providing for standards of management satisfactory to the federal government. Cooperation of this sort, which has proved its effectiveness in fire control under the Clarke-McNary Act, would provide a reasonable degree of federal leadership and guidance in a cooperative program without removing primary responsibility for and administration of regulatory measures from the states.

"Public Acquisition. — The committee believes that further federal acquisition of forest lands on a liberal scale can play an important part in taking care of situations where neither private owners nor the states can deal effectively with the problems presented, provided it is carefully planned to supplement, not displace, the acquisition program of the state concerned and the development of effective forest management by private owners. Such situations, in its judgment, exist in portions of the western and Lake States. It therefore recommends that the Association endorse in principle those provisions of the Pierce Bill (H. R. 615) and of the Hook Bill (H. R. 3793) which relate to the acquisition and administration of lands for national forest purposes. It believes that other matters covered by these bills are not an essential part of the program of federal acquisition and should be presented in separate legislation.

"Forest Protection.—In addition to the matters specifically referred to it, the committee recommends (1) that in any statement which the Association may issue on these matters it also emphasize strongly the importance of protection from forest fires, forest insects, forest diseases, and other natural forest hazards as the essential basis of any program of forestry and land use; and (2) that the Association support vigorously any legislation that will contribute to the full development of the Clarke-McNary principle of federal cooperation in the prevention and control of such hazards. In many

(*Continuing on page* 544)

TREES AND THEIR USES—No. 60—ASPEN


ASPEN, OR QUAKING ASP, IS A TREE FREQUENTLY 40 TO 50 FEET HIGH WITH A SLENDER TRUNK 18 TO 20 INCHES IN DIAMETER.
A TREE OF THE NORTH, ASPEN IS FOUND FROM THE SOUTHERN SHORES OF HUDSON'S BAY, NORTHWEST TO THE VALLEY OF THE YUKON, SOUTH THROUGH THE MOUNTAINS INTO MEXICO AND LOWER CALIFORNIA, AND ACROSS THE NORTHERN PLAINS STATES TO NEW ENGLAND AND THE SOUTHERN APPALACHIANS.
THIS TREE IS GENERALLY DISTRIBUTED ON MOIST, SANDY SOILS AND GRAVELLY HILLSIDES. IT IS VALUABLE FOR THE ABILITY OF ITS SEEDS TO GERMINATE QUICKLY IN SOIL MADE FERTILE BY THE PASSING OF FIRE, AND OF ITS SEEDLINGS TO GROW RAPIDLY IN EXPOSED AREAS.
THE WOOD OF ASPEN GENERALLY GOES INTO PULP AS WELL AS EXCELSIOR, MATCHES, FURNITURE AND VEHICLE PARTS.
ONE DISTINCTION THAT ASPEN CAN LAY CLAIM TO IS THAT IT IS ONE OF THE MOST WIDELY DISTRIBUTED TREES IN AMERICA, IT BEING NATIVE TO BOTH CALIFORNIA AND MAINE.
ASPEN IS ALSO CALLED QUAKING ASP DUE TO THE ALMOST INCESSANT TREMBLING OF ITS BROAD, EGG-SHAPED LEAVES. IN AUTUMN, THESE LEAVES TURN A BRILLIANT YELLOW, LIGHTING UP WHOLE MOUNTAIN SIDES. ALTHOUGH IT IS SHORT-LIVED, ASPEN MAKES A PRETTY SHADE AND ORNAMENTAL TREE.
HI, BROTHER!
WHAT'RE YOU SHAKIN' FOR, MR. ASPEN?
I'M JUST QUAKIN' A BIT BEFORE PARDY-
-PARDY

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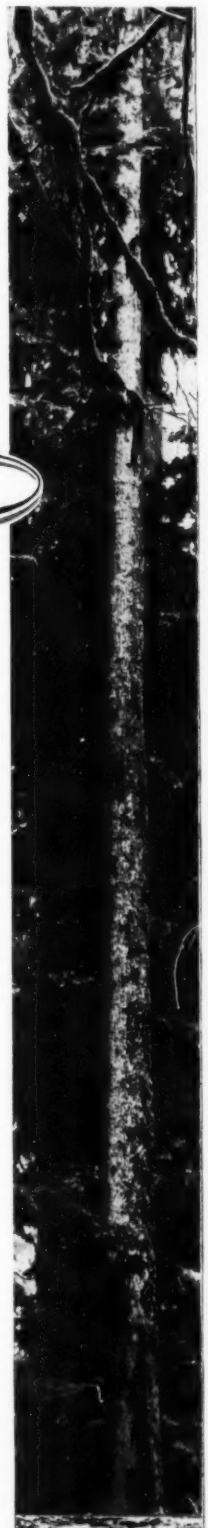

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FOREST OF DISCOVERY

By VIRGIL FULLING

THE nation's newest national forest—The Forest of Discovery—was dedicated on September 28, in west Tennessee, as more than 7,000 people, drawn from every walk of life, watched the impressive ceremonies held on a tract of high bluff land bordering the Mississippi River, two miles from historic Richardson's Landing.

Distinguished guests from every part of the nation participated in the inaugural exercises for the forest which will embrace approximately 150,000 acres along the Mississippi River in the counties of Shelby, Tipton, Lauderdale, Dyer and Obion. The dedicatory services were held on the 400th anniversary of the discovery of the Mississippi River by Hernando DeSoto, and thus commemorated that historic event. It is from this rediscovery of the river and its adjacent timberlands by inhabitants of the great valley that the new forest takes its name—Forest of Discovery.

Forestry officials present at the dedication were amazed at the enthusiastic response for the Forest of Discovery shown by the citizens of west Tennessee. They saw in it a greater appreciation and support of conservation activities on the part of the average American. As Earle H. Clapp, acting chief of the United States Forest Service, said in his address during the ceremonies, "This celebration far surpasses in its expression of public interest, anything in the history of the American forest movement."

Mr. Clapp accepted in behalf of the Forest Service the preliminary tracts of land to inaugurate the new project. "The widespread, enthusiastic and determined movement behind the establishment of this Forest of Discovery," he said, "is

Earle H. Clapp, acting chief, United States Forest Service, dedicating the Forest of Discovery in Tennessee as "a living monument of eternal growth."

adequate assurance of its vigorous support, and a challenge to the United States Forest Service to make this national forest second to none in its significance, and second to none in its social service. This, I pledge you, the Forest Service will make every effort to do.

"The federal government is delighted to adopt this project as one of the country's national forests. Within the broad limits of the selected area, as funds become available, lands suitable for permanent forest management will be acquired and administered in the public interest.

"Today we look not only at the river and its valley, but at the vast significance attached to the dedication here. Sponsors of this forest have said, 'Let this Forest of Discovery be useful in all ways that a forest may be useful, in the saving of soil and water, the growth of timber, provision for hunting and fishing. Let the forest contain as its central figure, a Grove of Repentance—a symbol of the nation's resolve to turn from waste of its natural resources to conservation for the future.'

"We dedicate this new forest not as a dead monument of bronze and stone, but as a living monument of eternal growth," Mr. Clapp concluded.

Speakers on the dedicatory program included in addition to Mr. Clapp and Mayor L. D. Hamner, of Dyersburg, J. Charles Poe, conservation commissioner of Tennessee, representing Governor Prentice Cooper; Edward K. Love of St. Louis, donor of the Edward K. Love Conservation Foundation of Missouri; Mrs. Wardlaw Steele, vice-chairman of the National Forest of Discovery Committee; C. H. Cobb, prominent attorney and conservationist of Union City, Tennessee; and Mark Walker, Jr., of Covington, Tennessee.

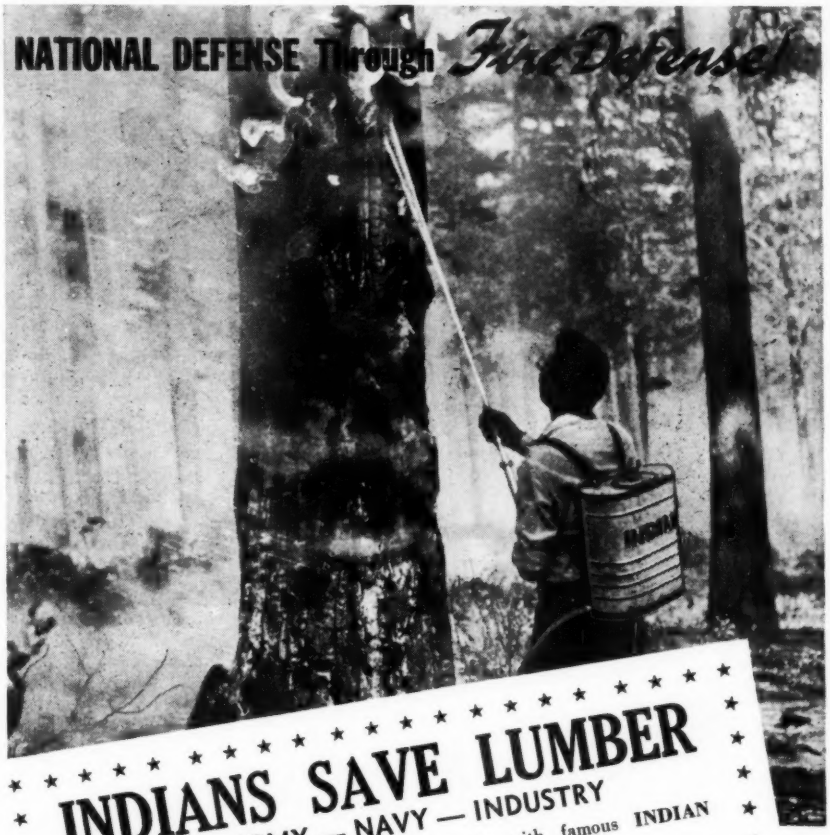
Joseph C. Kircher, regional director of the Forest Service at Atlanta, Georgia, and Clyde Carpenter of Knoxville, president of the Tennessee Junior Chamber of Commerce, were in charge of tree planting ceremonies.

The Tennessee Junior Chamber of Commerce co-operated with the National Forest of Discovery Committee in sponsoring and working for the new national forest. Heading the Junior Chamber participation was Rodney Baber, conservation chairman of the state organization.

The National Forest Committee for west Tennessee, which later became the National Forest of Discovery Committee, led the campaign for establishment of the new national forest along the river. It was joined by such able leaders as Senator Wall Doxey of Mississippi.

The Memphis *Press-Scimitar,* under the editorship of Edward J. Meeman, gave its full support to the forest movement.

The National Forest of Discovery Committee has members representing five west Tennessee counties. They are: John R. Flippin of Memphis, chairman; Will S. Roper, Clyde Walker, Mark Walker, Jr., Mrs. Wardlaw Steele, Acton Holmes, Vernon Peters, C. H. Cobb, R. A. Everett, J. W. Hart, Jr., L. D. Hamner, Will H. Parks, James Wilkes, Edward J. Meeman, Rodney Baber, and Virgil Fulling.



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More CCC Camps Close

TWO hundred CCC camps will be closed around November 1, according to James J. McEntee, Civilian Conservation Corps director. This will leave the Corps with 900 camps and approximately 160,000 enrollees, a reduction from 1,500 camps and over 200,000 enrollees since last April. At the same time Director McEntee stated that the CCC probably would turn back into the Treasury at the end of the fiscal year $47,000,000 of its $247,000,000 appropriation unneeded because of the reduced number of enrollees. Reduction of the number of camps in November will result, he said, from large numbers of enrollees finding jobs in private indstry. It is estimated that 6,000 men are leaving the camps each month.

Earlier, at a White House press conference, President Roosevelt indicated that some action might be taken to utilize the Civilian Conservation Corps in a large scale reconditioning program for men rejected for military service because of their physical condition. This was followed by the disclosure that Paul V. McNutt, Federal Security Administrator, has recommended that Congress make CCC facilities available for the correction of physical conditions among selective service men. According to the press, Representative Norton of New Jersey, chairman of the House Labor Committee, made public a letter from Mr. McNutt saying that the CCC has "great potential value" for the rehabilitation of such men.

Western Clubs Oppose Mining In Parks

DEFINITE opposition to relaxing established standards by opening the national parks and national monuments to mining, grazing, or hunting was voiced by the Federation of Western Outdoor Clubs at its tenth annual convention at Nesika Lodge, Oregon, in September. Also, the Federation petitioned Congress to make adequate provisions for continued maintenance of fire protection, sanitation and other measures of public safety in the national forests and parks, projects now endangered by the closure of CCC camps and work projects.

On the subject of opening national parks and monuments to mining, E. P. Leavitt, superintendent of Crater Lake National Park, addressing the convention, said, "The question of mining is one of very serious concern. In the early days of the National Park Service work some of us were known as 'purists,' in that we were not willing to accept national parks or accept boundaries proposed for national parks or monuments unless we could get everything that we felt we ought to have, and unless we could eliminate the things we felt objectionable. However, in some cases it has been necessary to accept some of these areas under conditions we did not fully approve of, if that were the only way we could get them, and then work toward the elimination of undesirable legislation or features. We realize the danger of establishing a precedent that would tend to tear down the high standards that have been set and maintained all these years, and that is a thing we must very definitely guard against. I understand that where mining is a very important part of a national monument area, and it is more important generally in monuments than in parks, consideration has been and is being given to elimination of these areas where the mineral justifies mining activities."

Regional Forester Lyle F. Watts, on the subject of national forests, said: "In these days of feverish haste to build planes and cantonments, houses and shell boxes, hangars and ships for national defense, we are apt to forget the long look ahead. Some day when the struggle against totalitarianism has been won, we will again be faced with the great peacetime problems. One may be sobered by the excessive rate at which our Pacific Coast forests are melting before defense needs, and still cheer on the mills to even greater lumber production. Surely no higher use can be conceived for our fine forests than that of protecting the democratic way of life.

"Yet, we should face squarely the fact that such great lumber production will accentuate old and create new problems for the future. The rate of cutting in the Pacific Northwest was already too fast, and is being increased to the maximum degree. The total lumber production for Oregon and Washington was 7,000,000,000 board feet in 1938, 9,000,000,000 feet in 1939, 10,000,000,000 feet in 1940, and may well reach 11,000,000,000 feet in 1941. Unfortunately, much of that great increase in production is in the sections of the two states where the cut already was farthest out of line. The available supply of sawtimber tributary to these centers won't last long at the present rate.

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Please Mention AMERICAN FORESTS When Writing Advertisers

One of the principal questions to come before the convention was a letter from Charles W. Elliott, director of National Resources Planning Board, relating to mining and prospecting in the national forests. The convention went on record with a view of getting some relief by an act of Congress to remedy this evil.

Another letter from Newton B. Drury, director of National Park Service, related to the entrance of bona fide mountaineering organizations into national parks. Said Mr. Drury: "Motor vehicles carrying only members of educational, welfare, and scientific organizations, such as boy scouts, accredited schools and universities, or bona fide mountaineering organizations, when the trip to a park or parks is initiated, organized and directed by such organization, will be admitted to the parks without charge other than the usual automobile license fee, and only when credentials from the head of such institution or organization are shown."

Mississippi Appoints New Forester

The Mississippi Forestry Commission has announced the appointment of Albert A. Legett, of Mendenhall, to serve as state forester for the unexpired term of Fred B. Merrill who resigned June 13.

Mr. Legett was formerly manager and supervisor of Mississippi Nurseries and later became associated with the Mississippi Forest Service, supervising timber surveys and topographic mapping in south Mississippi.

Mr. Legett entered the Soil Conservation Service in 1935 as junior administrative assistant of soil camps, and was promoted to assistant soil conservationist and district leader, the position he was holding at the time of his appointment as state forester.

Incendiary Fires Sweep California

Timber and brush fires, most of them thought to be man-set, swept across central California early in October burning over an estimated 100,000 acres of forests and grass lands and causing damage in excess of $1,000,000. Eight thousand men battled a score of major blazes, the largest of which were in the Los Padres National Forest and on state land in Yuba County, where two fires burned over 12,000 acres. At the time of going to press all blazes were reported under control. One life was reported lost in the California fires; J. F. Mastig, 65-year-old lumber worker, died from overexertion while fighting a 4,000-acre blaze on Strawberry Peak.

In the East, several thousand CCC enrollees battled fires raging in the Adirondacks of New York. The worst fires were in Clinton and St. Lawrence counties. In the vicinity of Brasher Falls, near the Canadian border, nearly 30,000 acres were burned.

While fire-fighters were battling these blazes, the U. S. Forest Service, with the beginning of National Fire Prevention Week, October 5 to 11, announced its annual forest fire summary for 1940. Highlight of this was that unprotected woodland suffered twenty-seven times more burn and twenty-one times as much damage as protected forests in the country during 1940. One-half of the nation's forest fires occurred on the one-fourth of the total forest land area which still lacked organized protection last year. Total unprotected acreage was 146,749,000, largely privately owned. Federal, state and private agencies now protect 435,429,000 acres of forest land, the report revealed.

While only three-fourths of one per cent of the protected area suffered from fire damage last year, more than fifteen per cent of the unprotected area was burned. There were 195,427 forest fires —one every two and a half minutes— during the 1940 calendar year, compared with 212,671 in 1939. Total damage amounted to $35,877,000 against nearly $40,000,000 in 1939. The fires of 1940 averaged 25,848,000 acres of forest land. In 1940 the unprotected woodland alone suffered 107,824 fires resulting in $28,227,000 damage to 22,431,000 acres. The protected land had 87,603 forest fires during the year.

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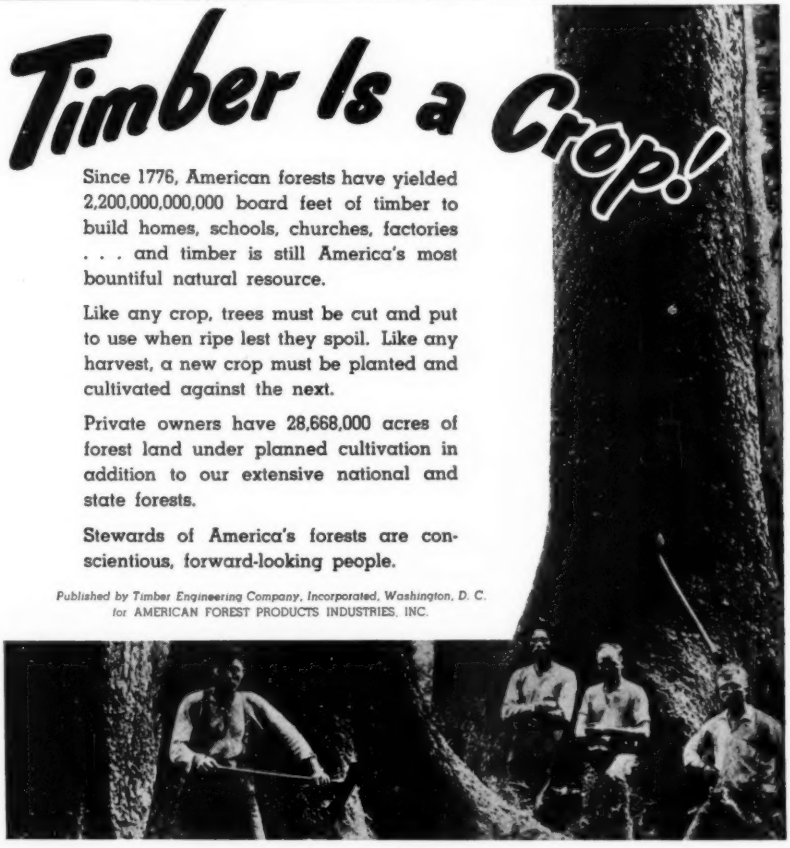
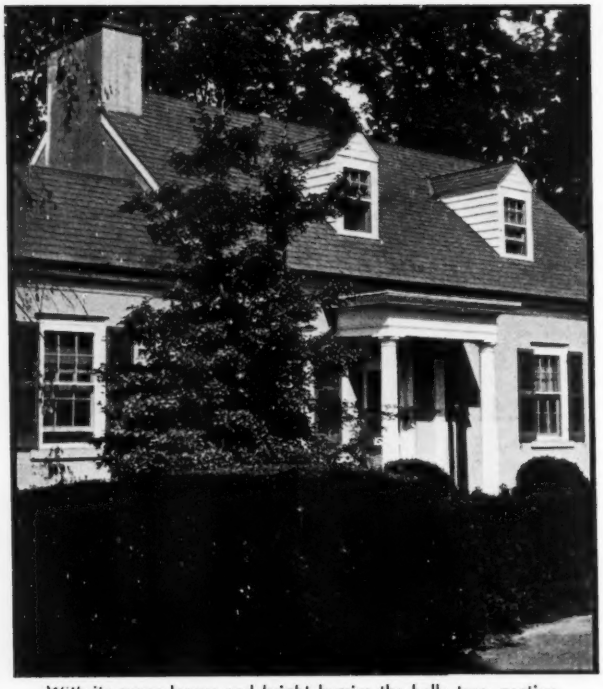




With its green leaves and bright berries the holly tree, particularly in winter, lends a welcome touch to the home property

YOUR SHADE TREES:

HOLLY,—NOT ONLY FOR CHRISTMAS

By DEVEREUX BUTCHER

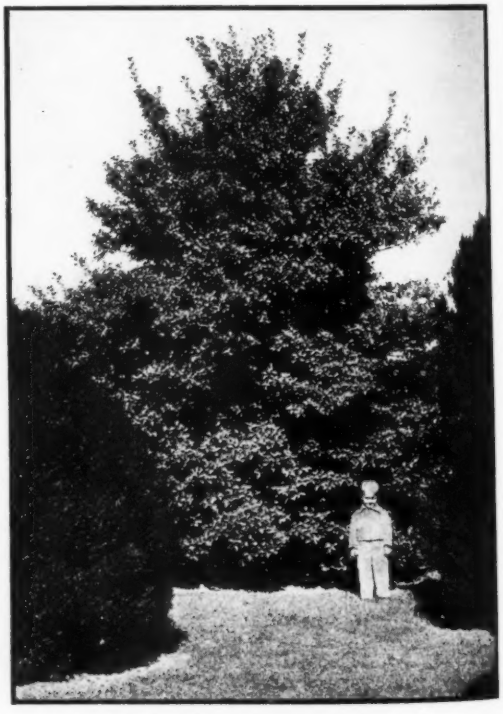
Photographs by the Author

MENTION of holly brings to mind the Christmas season, which once again is just around the corner. So extensively is holly used in decorating homes at this time that people everywhere are familiar with its prickly leaves and bright red berries; but as a tree it is less widely known. Our native American holly, *Ilex opaca,* though once having a range from Massachusetts to Florida and west to the Mississippi Valley, has been exterminated over much of this area by destructive cutting and unscientific harvesting. Yet, this tree, when planted anywhere within its former range and in sheltered positions farther north, and probably in sufficiently moist locations farther west, is one of the finest of our broadleaved evergreen ornamentals.

The distinctive effect of holly on the home grounds and in parks may be achieved with any of several species and varieties. The American holly and its yellow-berried variety, *Ilex opaca xanthocarpa,* are most used in the East, but among the introduced species there are the smaller leaved, trim-looking Japanese varieties, *Ilex crenata,* hardy as far north as southern New York if planted in well protected sites, and *Ilex crenata microphylla,* which is hardy from Massachusetts southward. These are shrub-like and well suited for base plantings. There is the Chinese holly, *Ilex cornuta,* which can be grown fairly far north. This has thicker and more leathery leaves, and is suitable for base plantings as well as for hedges. Acclaimed the most beautiful of all hollies is the English or European species, *Ilex aquifolium,* of which there are many varieties. Leaves of this tree are glossy and dense, and the berries more brilliant than those of our native tree. It will endure much pruning, but is less hardy than the native species, being grown most successfully only in the mild, moist climates of the Southeast and the Pacific Northwest.

Hollies are attractive at all seasons. American holly in spring has small white-petaled flowers growing in clusters or scattered along the twigs, and these are accompanied by the bright green new leaves. Darkening to a somber green as the season advances, the foliage makes an excellent background for flowering plants, or as an accent in landscape effects such as along driveways, at entrances, or at the end of a garden walk. The density of the foliage makes it ideal for hedges also; and certainly there could be nothing more pleasing than groups of holly planted at the sides of a doorway. Here their effect will be most welcome in winter, for at this season when color is lacking elsewhere, the evergreen leaves and the bright berries of the pistillate trees add a note that no other plant or tree can give. When planted in green gardens or in mixture with boxwood the leaves also lend a touch of variety in the foliage pattern. Tolerant to some shade, it is adapted to edge plantings around clumps of taller trees and along the borders of woods.

In selecting a tree, it must be remembered that only the pistillate tree produces berries; but unless there is a pollen-producing tree in the near vicinity berries



Variety of foliage patterns is afforded by the combined planting of holly and boxwood

will not develop. Therefore, when planting one or more pistillate trees in a locality where there are no hollies, it will be necessary to plant at least one staminate tree.

Holly is not easy to transplant, particularly if taken from the wild, because the root-system is large and develops a taproot. During the process of moving, roots must not be allowed to dry out, and any that become exposed should be covered with wet burlap. Nursery-grown trees are easiest to handle and will ensure best results because the roots are more compact owing to previous moving. Considerable pruning is necessary, especially for trees taken from the wild, and if leaves of a newly planted tree shrivel, further pruning should be done immediately.

Seldom is holly used as a hedge, yet its dense evergreen leaves make it ideal for screening

The hollies will grow in several kinds of soil, but best growth is obtained when they are planted in well-drained, deep, sandy or gravelly loam that is strongly acid. Soils not entirely suited can be improved by mixing well-rotted oak leaf mold into the soil at the time of planting. To conserve moisture after planting, a layer of compost or decayed leaves should be placed over the roots, and during very dry periods of weather transplants should be watered for the first year or two.

In the Pacific Northwest, October is the best time for transplanting. Elsewhere spring is usually considered the most satisfactory time, with the exception of the South, where planting can be done at any time except during the growing season.

To the owner of a small property, holly should be of special interest because it is a comparatively slow growing tree that seldom reaches a greater height than forty feet. Branches are not wide-spreading and will not bring about undue crowding of nearby vegetation. And to the bird-lover, whether he owns a large or small property, holly will be of further interest because in winter the berries attract birds.

An advantage to the use of holly is that as compared with most other trees it has few pests. Leaves are sometimes attacked by several species of fungi. Tar spot fungus, which in May produces yellow spots that later turn reddish brown and by fall are black with a yellow border, can be checked by applying a copper spray at two-week intervals starting in May or June. Rarely does this disease cause premature defoliation. Sometimes the leaves of the previous season are attacked by other kinds of spot-producing fungi, but these can be controlled by an application of bordeaux mixture or a copper spray in late summer or autumn. Drought during the preceding year may be the cause of such attack as well as poor soil. The picking and burning of infected leaves will prevent the spread of fungus spores. Copper sprays may cause some injury to leaves, particularly any that have been attacked by the holly leaf miner. Presence of this pest can be recognized by the serpentine marks which it causes. It, too, can be controlled by picking and burning infected leaves at the end of the growing season, and by spraying with a nicotine and fish oil soap solution in May when the adult fly emerges.

In growing holly for commercial purposes, it is the rule to cut the lateral twigs along the branches. Anyone growing holly trees for ornamental purposes, therefore, may trim a few lateral twigs for his own use at Christmas time each year. Such trimming carefully done need not injure the shape of the tree.

The non-tarnish metal grill is fitted flush to the bowl, inside and out. A flick of the thumbnail opens and closes the grill. There is nothing to get out of order. The grill permits a full draught of air through the pipe, yet keeps coals and ashes from flying out of the bowl.

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CONSERVATION IN CONGRESS

PENDING introduction into Congress of one, possibly two, omnibus bills, Department of Agriculture reports to the House and Senate Agriculture and Forestry Committees on important forestry and conservation legislation have been held up in the Forest Service. One of these omnibus bills is understood to contain the recommendations of the Forest Service and the Department of Agriculture to the Joint Congressional Forestry Committee and the other the Joint Committee recommendations to Congress. In the process of preparation for the past several months, it is probable that one or both bills will be introduced within the next few weeks. Since most Congressional committees now refuse to hold hearings on bills of a non-defense character it may be expected that the omnibus bills will be predicated upon the present emergency.

The legislation will probably include provision for public regulation of private forest lands similar to that contained in the Pierce bills, H.R. 3849 and H.R. 3850; cooperative sustained yield units as proposed in the McNary-Doxey bill, S. 1093 and H.R. 4308; national forest acquisition for Oregon and Washington as contained in H.R. 615 introduced by Representative Pierce, of Oregon; national forest acquisition for Michigan and Wisconsin as proposed in the Brown-Hook bills, S. 1131 and H. R. 3793; expansion of the forest survey as contained in the McNary-Randolph bills, S. 601 and H.R. 628 and forest credits to landowners similar to the McNary-Pierce bills, S. 1136 and H.R. 3458. This omnibus legislation may also include provision for increased forest protection funds; payments to counties in lieu of taxes on federally owned and acquired lands; expansion of national forests by increased acquisition and additional assistance to farm forestry.

Leadership changes in the House Appropriations Committee made necessary by the recent death of Chairman Edward T. Taylor, of Colorado, include Representative Clarence Cannon, of Missouri, as chairman of the whole committee and also chairman of the Deficiencies Subcommittee; Representative Malcolm C. Tarver, of Georgia, replacing Representative Cannon as chairman of the Agriculture Appropriations Subcommittee; Representative Jed Johnson, of Oklahoma, as chairman of the Interior Appropriations Subcommittee, and Representative Butler B. Hare, of South Carolina, as chairman of the Subcommittee on Labor-Federal Security Appropriations.

Distribution to cooperating states of $2,165,265 out of the $2,425,000 item for cooperative forest fire control under the Clarke-McNary Act for the current fiscal year leaves a $259,735 balance to be used by the Forest Service as follows: administration and inspection, $171,235; contingent and impoundments, $40,000; forest taxation and insurance study, $45,000, and radio service to states, $3,500. The new cooperating states of Utah and Iowa will each be given small sums to aid in forest fire protection this fiscal year. California, with a total of $258,642, received the largest Clarke-McNary allotment of any state; Washington is next with $197,000, and Oregon third with $157,354. Other leading states are Michigan, which received $136,100; Florida, $119,368; Minnesota, $99,711, and Wisconsin, $93,381.

Contained in the Second Supplemental National Defense Appropriation bill, H.R. 5788, is a $150,000 item, largely earmarked for research and technical services in forest products urgently needed in connection with the national defense program. In reporting this bill the Deficiency Appropriations Subcommittee reduced by $67,500 the original $217,500 supplemental estimate for this purpose as submitted by President Roosevelt on August 21. Passed by the House on October 10, this measure is expected to be enacted by the Senate and signed by the President within a few days. If the $150,000 item is enacted the Forest Products Laboratory appropriation for the current fiscal year will total $932,500.

Disallowed by the Deficiencies Subcommittee in reporting H.R. 5788 was a $300,000 supplemental estimate for cooperative farm forestry, "to extend, cooperatively, in so far as possible with the States, technical assistance to farmers in areas of heavy timber demand in order to assist them to obtain a fair price for farmwoods products sold and to assure that cuttings made leave farm woodlands in a productive condition."

The House on October 16, passed the Murdock bill, H.R. 2675, to permit mining within the Organ Pipe Cactus National Monument in Arizona. Its Senate companion bill, S. 260, sponsored by Senator Hayden, passed the Senate on May 23, over the objection of various conservation organizations who contend that the bill nullifies the purposes for which the monument was established and will set a precedent for further violation of the purposes for which the national monuments and parks are created.

Applying to farmers' wood lots only, Representative Fulmer's new "Cooperative Farm Forest Restoration" bill, H.R. 5666, declares it to be the policy of Congress to "aid in establishing and operating farm forest products cooperative marketing associations." House Agriculture Committee Chairman Fulmer has indicated that his new bill, which differs from his "Cooperative Forest Restoration" bill, H.R. 969, only in its exclusion of forest land owners other than farmers, will have precedence among forestry bills coming before the committee.

CONSERVATION CALENDAR

Important Bills in Congress with Action September 6 to October 15, 1941

FORESTRY

H. R. 5666—FULMER—To authorize the Secretary of Agriculture to enter into cooperative agreements or leases with farmers in order to provide for the management of their forest lands and the marketing of their forest products in accordance with proper forestry and marketing practices. Introduced September 17, 1941. Referred to the Committee on Agriculture.

NATIONAL MONUMENT

H. R. 2675—MURDOCK—To permit mining within the Organ Pipe Cactus National Monument. Passed House October 15, 1941, and the companion bill, S. 260, which had already passed the Senate May 23, 1941, was substituted for the House bill.

NATIONAL PARKS

H. R. 2320—WEAVER—To accept the cession by the States of North Carolina and Tennessee of exclusive jurisdiction over the lands embraced within the Great Smoky Mountains National Park. Amended and passed by the House October 6, 1941. Referred to the Senate Committee on Public Lands and Surveys October 9, 1941.

PUBLIC DOMAIN

H. R. 3185—MOTT—For the relief of the State of Oregon, Department of Forestry of the State of Oregon, and certain organized protection agencies in the State of Oregon for protection of unappropriated public forest lands intermingled with Oregon and California lands from July 1, 1938, to June 30, 1939. Passed House October 6, 1941. Referred to the Senate Committee on Claims, October 9, 1941.

H. R. 5683—ROBINSON, Utah—To authorize the Secretary of the Interior to acquire lands or interests in lands for the Geological Survey. Introduced September 18, 1941. Referred to the Committee on the Public Lands.

WATER AND STREAM CONTROL

S. 1913—WHITE and BREWSTER (H. R. 5676—MRS. SMITH)—To create a Division of Water Pollution Control in the United States Public Health Service, etc. Introduced September 17, 1941. Referred to the Committee on Commerce.

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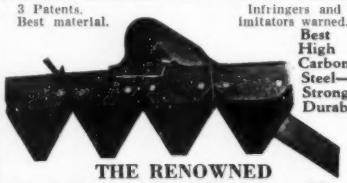
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The Griffin Wellpoint Corporation, of New York City, has in production a line of portable fire-fighting trailers. The equipment consists of a centrifugal pump, self-priming of its own design, which has a capacity of 150 G.P.M. at 125 pounds pressure when operating at 2,000 R.P.M. The engine is 4-cylinder Wisconsin air cooled, which develops 16½ H.P. The trailer itself is constructed of 4-inch steel and the wheels carry 6.00 x 16 tires. The hose containers are of 14 gauge steel with 18 gauge metal partitions. The trailer is 55 inches high, 67 inches wide, 110 inches long. It weighs 2,160 pounds.

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The most rigid requirements of heavy construction and all-season maintenance are fully met by the new, all-wheel drive and steer 99-M motor grader offered by the Austin-Western Road Machinery Company. All wheels are equipped with large diameter tires, equal in size for convenient interchangeability, and all wheels are driven and steered by power. As a result, the 99-M can grade steeper bank and ditch slopes, with a longer blade; and it can offset the frame to distribute power along the entire moldboard to move heavier loads. Other advantages are increased maneuverability and a short turning radius.

Adjustments are all made by hydraulic power control from the cab, including shifting the blade on its arms; reversing circle; steering front and rear wheels, and raising and lowering blade. When attachments are used, hydraulic power operates scarifier, loader, roller, bulldozer, snow plow and snow wing.

AUTOGIROS SPOT FIRES

Autogiros, the type of aircraft capable of landing and rising in smaller spaces and traveling at lower rates of speed than other airplanes, are playing an important part in the conservation work of the National Park Service. Not only have they proved their superlative value in spotting forest fires and carrying supplies to firefighters but plans are being made to use the giros in animal census taking, particularly in such areas as Death Valley National Monument, California, and Yellowstone National Park.

In addition, the machines are employed in surveying by aerial photography national park areas suited to recreational development. Based at Manteo, North Carolina, near the proposed Cape Hatteras National Seashore, and at Boulder Dam national recreational area, Nevada, each autogiro, secured from the Army, has a carrying capacity of approximately 2,500 pounds.

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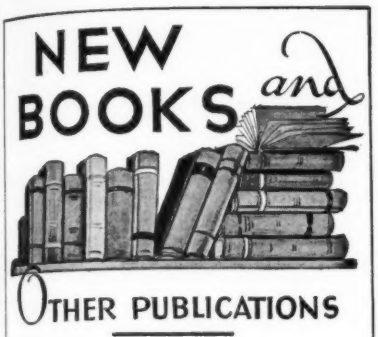

OTHER PUBLICATIONS

A list of Selected Books on Forestry and related fields of Conservation is available to members of The American Forestry Association on request.

MY COUNTRY 'TIS OF THEE, by Lucy Sprague Mitchell, Eleanor Bowman and Mary Phelps. The Macmillan Company, New York City. 335 pages, ills. Price, $3.50.

With a subtitle—"The Use and Abuse of Natural Resources"—this book sets down frankly what is happening to our wealth of natural resources, and what must be done to conserve them—with particular reference to soil, coal and oil. The simple but vivid text, the profuse and graphic illustrations point the processes of national development or decay. As one reviewer has said, it "presents clearly the human drama through which natural wealth is changed from earth stuff to the things we all need." All three authors are educators and the book is a "must" for conservationists.

PLANT GALLS AND GALL MAKERS. by Ephraim Porter Felt. Comstock Publishing Company, Ithaca, N. Y. 364 pages, ills. Price, $4.00.

An authoritative work on a subject which will answer many questions for many people interested in this little known phase of natural history, for galls are deformities occurring in a great variety of plants, and present many, as yet, unsolved problems in biology. More than 700 illustrations, many of them original, embellish the text.

THE CHEMISTRY OF PULP AND PAPER MAKING, by Edwin Sutermeister. John Wiley and Sons, New York City. 529 pages, ills. Price, $6.50.

This is a third edition, designed to bring the book down to date and to cover the rapidly changing conditions obtaining in the pulp and paper-making industry. Published primarily for chemists, it includes all technical details necessary for the chemical engineer to get a complete understanding of the chemistry involved in manufacture, going into mechanical phases only in so far as necessary. Modern theory and knowledge has thrown light on what was formerly mystery and further work and chemical research is resulting in constant enlargement of this intensely interesting field of knowledge.

The publications listed below must be ordered direct from the addresses as given and not through the Association.

Irrigation Problems in Citrus Orchards, by C. A. Taylor. Soil Cons. Serv., U. S. Dept. Agr., Farmers' Bulletin 1876. Supt. of Docs., Wash., D. C. Price 15 cents.

Influence of Altitude and Aspect on Daily Variations in Factors of Forest-Fire Danger, by G. Lloyd Hayes. Nor. Rocky Mtn. For. and Range Exp. Sta., U. S. D. A. Supt. of Docs., Wash., D. C. Price 10 cents.

Publications of the National Resources Planning Board, Washington, D. C., published by the Government Printing Office and for sale by the Superintendent of Documents, Washington, D. C., at the prices listed:

Development of Resources and Stabilization of Employment in the United States:
- Part I—The Federal Program for National Development. Price 25 cents.
- Part II—Regional Development Plans. Price 80 cents.
- Part III—Functional Development Policies. Price 15 cents.

Research—A National Resource. Part II. Industrial Research. Price $1.00.

Land Classification in the United States. Price 60 cents.

Public Land Acquisition. Part II—Urban Lands. Price 20 cents.

Resources and Opportunities of the Mid-Continent Area of the United States. Issued by the Mississippi Valley Association, St. Louis, Mo.

Log Scaling and Timber Estimating, by James D. Pond. Cornell Junior Extension Bulletin 39. N. Y. State Coll. of Agr., Cornell Univ., Ithaca, N. Y.

Virginia Wildlife, published by the Virginia Commission of Game and Inland Fisheries, Blacksburg, Va. Price, 10 cents.

1940 Report of the State Game Warden, Maryland State Game and Inland Fish Commission, 514 Munsey Building, Baltimore, Md.

"My Fish Friends," by Myron E. Shoemaker. Gray Printing Company, Inc., DuBois, Pa.

Teacher's and Student's Manual, by Myron E. Shoemaker—to accompany "My Fish Friends." Murelle Printing Co., Sayre, Pa.

Plowing for Terrace Maintenance in the South, by John M. Downing and Philip M. Price. Soil Cons. Serv., U. S. Dept. Agr. Govt. Printing Office, Wash., D. C.

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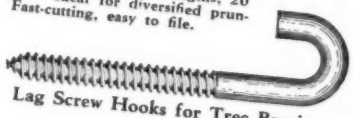

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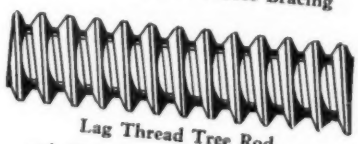

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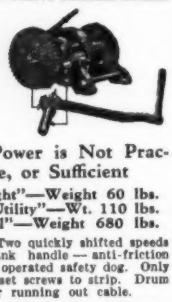

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Timber Rafting on the Delaware

(*Continued from page* 517)

be left behind. At Narrowsburg the river is "throttled down" between high banks where the ice often jammed in spring and held up rafts for days. At ten-Mile River, in the great flood of 1869, scores of rafts which had tied up there for safety were torn loose and lost.

Milford, Pennsylvania, was a favorite stopping place for river men. Here, toward the close of the rafting era, the Yale School of Forestry established a summer camp to train men in better ways of handling woods, for by then the virgin stands were almost gone.

At Dingman's and at Flatbrookville and Pahaquarry on the Jersey side, ties and hoop poles were rafted. From Bushkill came large quantities of oak joists. These were usually made up in small floats with the joists set edgewise and held together by a spindle run through holes in the ends. The oars were small enough to be handled by one man.

Below the Water Gap the river was dotted with many local markets. School slates were made in Portland, Pennsylvania, and much cherry lumber was needed for the frames. Belvidere, New Jersey, an important log market for this town, was just above Foul Rift and many men preferred to sell their rafts rather than run through the rapids.

At Foul Rift the river has cut its way through a limestone ledge for nearly a mile, leaving the bottom rough and jagged with many hidden boulders which form a series of "hay-cocks" on the surface. Caught in these rushing waters, rafts occasionally crashed into sunken rocks and were shattered to pieces. In the eddy just below the rift a boat was usually waiting with liquor for the nervous crew, and at Hutchinson's on the Jersey side, many rafts tied up to make repairs.

Easton was the greatest log market on the river, where many rafts were sold. Here the junction of the Lehigh with the Delaware creates a treacherous swirl of currents and rafts were often wrecked against the abutments of the railroad bridges. At Tumble Falls rafts often stranded in low water and once when a number were thus aground and the men had gone to Warford's for dinner, a heavy thunder storm came up and washed them all away.

At Lower Black's Eddy or Point Pleasant many rafts tied up and took on local pilots to run Welles Falls at Lambertville. This was the most dreaded rapids on the Delaware, where the river passes through a series of rocky ledges with a drop of twelve feet in less than a mile. Rafts often ran this rift in strings—one close behind another—so that if one caught fast the next might knock it loose. Here every rock had its separate name. There was "Entering Rock" that wrecked green pilots at the start, and "Grass Rock" and "The Foamer." "Rodmans Rock" near the Jersey side was where a steersman by that name was lost. These and others played a part in rafting days when steersmen had to know each hazard on the river.

At Trenton the hands were paid off for the actual "run" was over. From here to Philadelphia the rafts drifted slowly on the ebbing tide or anchored when it flowed. In later days tugs towed strings of thirty or forty rafts down to the lumber market at Conrow's dock, Port Richmond in Philadelphia.

Timber rafting reached its peak in 1875 when over 3,000 rafts came down the river. From that date a swift decline set in, for the timber was disappearing rapidly in the absence of forestry practices. By 1900 the flood had fallen away to a dribble. In 1907 four rafts came down, then one in 1913. As late as 1921 ties and poles were brought down to Columbia, New Jersey, and in 1922 the last raft ran from Hancock to Callicoon, New York.

Today the virgin stands of the upper Delaware are gone and the lumber industry is dead. Communities that once lived by the woods are deserted. Second growth is creeping in but its quality is poor and fires keep the stocking down. There is little good farming land for the soil on the hills is thin and stony. This is a natural forest region and under proper management could be permanently productive of timber and men. Today it is a land of ghosts—a part of America that flourished briefly and faded under the destructive policy of complete exploitation.

Mountain That Breathes Fire

(*Continued from page* 519)

modern war machines seem childish. Only a few miles to the southwest of this devastation is the scene of an older but more violent disturbance. Today, Brokeoff Mountain dominates the skyline of the southwest corner of Lassen Volcanic National Park. This imposing mountain is but a fragment of a once mighty volcano called Mt. Tehama, which was a peak built up of alternating layers of lava and fragmental materials to a height of about 12,000 feet. This elevation was retained for an indefinite period of time, until Nature again went on a rampage.

This Blitzkrieg, which occurred in the late Tertiary time, probably started out as a series of violent explosions that fractured the rocks in the weaker upper portion of the mountain. After, or during, the eruptions the upper 3,000 feet of the mountain was destroyed, leaving a vast circular caldera about three miles in diameter. Brokeoff Mountain, Mt. Diller, and Black Butte are just jagged fragments of the caldera rim. The hot springs areas of the Sulphur Works and Little Hot Springs Valley represent dual conduits that once carried volcanic material

from the interior of the earth to the surface. The present activity of the hot springs is one of the last phases of the dying activity of once mighty Tehama.

In this area, now known as Mt. Lassen Volcanic National Park, are still other evidences of the irresistible forces of nature. In the northwest corner, in the Manzanita Lake area, are the Chaos Crags, Chaos Jumbles and the Dwarf Forest. Here avalanches and explosions from the Chaos Crags completely denuded an area of two and a half square miles only a few hundred years ago.

Again in the northeastern portion of the park are the famous Cinder Cone, the Chromatic Dunes and the fantastic Lava Beds. The history of this activity can be traced quite accurately through chemical, geological, physical and vegetative studies. Cinder eruptions and lava flows began in the middle sixteenth century and were repeated at about seventy year intervals.

The present aspect of this area is that of a gigantic slag heap surrounded by about twenty-five square miles of fine black cinders. Cinder Cone is the center of the scene and rises 700 feet above the surrounding country. To the west and south of the cone spread the highly colored Chromatic Dunes of numerous hues varying from yellow to purple. Beyond the dunes to the west, south and east lie the dull brownish black basaltic lavas.

In all of the areas mentioned nature is trying desperately to cover the devastated places, as if she were ashamed of her outburst of temper. Lichens, mosses, grasses, shrubs and trees are gaining a foothold and in time will reclothe the barren slopes. Then visitors to the park will have to rely on verbal or written stories to gain a picture of the events which took place. Today though, one may drive a car to the spot and see for himself the effects of tremendous forces of nature in action.

War Revives an Old Industry

(*Continued from page* 506)

produce burls when only forty years of age, most burls of commercial size come from plants many years older than this.

The plants in one patch of laurel examined on the Pisgah National Forest averaged well over 100 years of age, and one of the larger specimens showed about 200 annual growth rings on a section cut through the stem eighteen inches above the burl. It is the unanimous recollection of old mountain men that there was little undergrowth in most Appalachian forests prior to the establishment of fire control organizations by federal, state, and private agencies. As fire control became more effective, a forest understory developed and prominent in it were thickets of laurel and rhododendron. Such thickets are now so young that several generations may be required before burls of commercial size can be obtained from them.

Present burl operations are therefore apparently limited to the older stands of plants already in existence prior to the days of fire protection. These apparently escaped destruction by the periodic fires either by accident or because favorable natural conditions did not permit fires to become severe enough to kill the plants.

According to present indications, openings created by pipe stock operations will regenerate largely to tree species having light, wind-borne seed and to seedlings of laurel and rhododendron. Burl digging creates conditions very favorable for establishment of a new growth of such species, by breaking up the dense mat of roots, exposing mineral soil in small patches and providing entrance of direct sunlight. Recently germinated seedlings of nearby trees are already appearing in most openings. The most common species in this new growth are red maple, yellow poplar, hemlock and white pine.

Whether or not the new war-born industry will continue permanently in the southern Appalachians is now a matter of conjecture. Two factors will largely determine this. The first is the amount of raw material available and the second is the nature of economic conditions that will be established after the present war.

So little has the occurrence of laurel and rhododendron been studied that accurate estimates of the available supply of burls cannot yet be made. There are approximately forty million acres of forest land in the Appalachian and Cumberland mountains of West Virginia, Kentucky, Tennessee, Georgia, North Carolina, South Carolina and Virginia. Competent observers estimate that at least five to ten per cent of this area bears laurel or rhododendron. Therefore, it is probable that the total area on which these plants occur is measured in millions of acres.

The area bearing plants old enough to produce burls, however, cannot yet even be guessed at, nor can it be foreseen whether the available supply would support the industry until the great area of younger plants begins to produce usable burls. Both laurel and rhododendron occur outside the borders of the states mentioned above. In general their range is northward through Pennsylvania and Maryland into New York and the New England States. Whether the plants growing into these states produce sufficient burls for pipe block operations is not yet known.

Importers state that during peace times transportation charges on pipe blocks were lower from the Mediterranean to New York city than from shipping points in western North Carolina. The cheaper labor abroad also resulted in lower digging, sawing and curing costs than would have been possible in this country. If the economic conditions which existed prior to the present war are reestablished after its conclusion, the revived Appalachian forest industry will probably die as it has in the past. Meanwhile the industry is helping mountain farmers and mill workers to enjoy an era of relative prosperity without serious damage to Appalachian scenic values dependent upon the spectacular blossoms and evergreen foliage of laurel and rhododendron thickets.

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American Forestry Association Board

(*Continued from page* 530)

portions of the United States permanent forest management is still badly handicapped, or even unjustified, by the insecurity of forest properties from these hazards. Their marked reduction is essential in order to provide the basic security that forest owners must have to enable them to take advantage of the opportunities which otherwise exist for the adoption of constructive types of management. The committee believes that these facts cannot be stressed too strongly or too often by the Association."

Members of the Board's Committee on Forestry and Land Use are S. T. Dana, Chairman, Henry S. Graves, W. B. Greeley and L. F. Livingston. All members of the Committee supported the recommendations as to public acquisition and forest protection, but Mr. Graves took exception to the section on public regulation on the grounds that the urgency of regulatory action by the public in forest conservation warrants a clearer call for action.

Firemen in the Woods

(*Continued from page* 510)

Weyerhaeuser men are applying a new technique in the Northwest, which is being closely watched. It is simply the application to the woods of the principle of the city fire department:

"Get to the fire as fast as possible . . . put it out with water while it's small."

To accomplish this, the Clemons Tree Farm has developed what first appears to be an elaborate system but which really is simplicity itself. The plan falls naturally into three categories: First, detection; second, communication; third, actual suppression of fire.

Five lookouts, four company-owned and one state-owned, comprise the fire detection system. Ultimately, ninety miles of telephone lines, in addition to radios, will link the whole area with a central dispatcher at Weikswood, farm headquarters.

Then there is the fire department itself. This consists of seven large pumper tank-trucks, five pickup trucks—three of which are equipped with 300-gallon tanks, pumps and live reels—for patrol service; twelve portable pumper units, to utilize water from creeks and other natural sources in remote areas; twenty-four back-pack pumps and other auxiliary equipment.

Each tank-truck carries a two-way radio, giving instant communication with lookouts, dispatcher and other trucks. These fire engines are spotted at various division points, located in strategic areas of high fire hazard as well as at headquarters.

Naturally, this program has necessitated a well-developed road system, now under construction. Old logging railroad grades are being utilized, and new roads, rough but passable, are being pushed through the wilderness by big bulldozers. When completed, there will be 104 miles of primary and secondary roads, with maximum grades of twelve per cent, permitting speeds up to thirty-five miles an hour on the primary system.

In addition, there will be ninety-five miles of travelable fire breaks. When this system is completed, virtually every point in the area will be within 1,000-foot hose reach of a fire truck, carrying water and pumps.

* * * * *

This program captured the imagination of the people of Grays Harbor county. Nearly 2,000 of its residents attended dedicatory ceremonies in Montesano and heard Arthur B. Langlie, Governor of Washington, declare:

"If this project succeeds, it may set the pace for millions of acres of such lands throughout our state."

The audience heard Roderic Olzendam of Weyerhaeuser, a vice-president of The American Forestry Association, compare the farm forest with the original stand:

"The first timber crop paid no taxes during most of its growing period, because man was not there; the second will pay taxes all the time it is growing.

"There was only one harvest of the first stand in 300 years; the next 300 years will provide more than three harvests.

"Less than forty per cent of the first crop could be used; we will use over eighty per cent of the second crop, probably more.

"The first harvest left the land unproductive; scientific harvesting of the second and subsequent crops will enable the land to produce tree crops on down through the decades."

* * * * *

There are sizable trees on the area today, forty and fifty years old, which, in a few years, will be harvested. But the complete test of the plan must await a crop rotation of something more than fifty years, and a new generation of tree farmers. But, so far, there has been nothing half-hearted about the program on the part of either the company or the public.

Approximately $100,000 is the initial investment in construction and equipment. Along with it goes a comprehensive program of public information, based upon the realization that public cooperation is vital if fire is to be prevented.

The Clemons Tree Farm is no "king's forest." There is no wall around it. The tree farmers are taking the public into their confidence and are asking the public to share the responsibility for ultimate success. The area is open to hunters, fishermen, berry pickers and others, subject to usual fire rules.

The Clemons Tree Farm, in short, not only is an experiment in a new method of forest fire control and timber production in the Northwest, but it is also expected to be an inspiring demonstration of partnership between industry and the public, for their mutual benefit.

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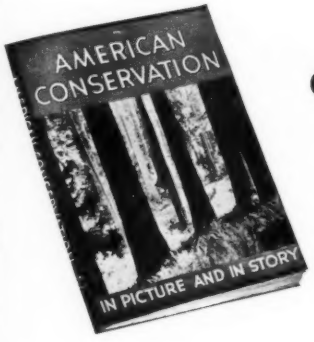

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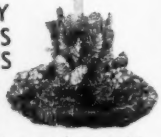

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The AIKEN NURSERIES, Inc., Box H, Putney, Vermont.

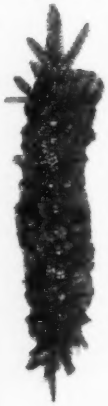
Please send me the articles checked below. I enclose remittance to cover prices. F.O.B. Putney, Vt. We prepay Gift Orders and bill you carriage charges.

- ☐ 1 Xmas Door Bell $2.50
- ☐ 1 Xmas Basket $3.75 ☐ 3, $10.75 ☐ 12, $42.00 All Jam 12 for $3.50
- ☐ 1 Candlestick $1.50 ☐ 2 for $2.50
- ☐ 5 Yds. Heavy Roping $3.50
- ☐ 10 Yds. Heavy Roping $6.00
- ☐ 5 Yds. Lighter Roping $2.00
- ☐ 10 Yds. Lighter Roping $3.50
- ☐ 1 No. 2 Wreath $1.75 ☐ 3 for $4.50 ☐ 6 for $8.50
- ☐ 1 Partridge B. Bowl $1.50 ☐ 3 for $4.00 ☐ 12 for $15.00
- ☐ 1 Balsam Basket Wreath $1.75 ☐ 3 for $4.50
- ☐ 1 12"-18" TREE $1.25 ☐ 6, $6.00
- ☐ 1 18"-24" TREE $1.50 ☐ 6, $7.50
- ☐ 12 Berried Sprays $1.00
- ☐ 1 Fireplace Set $7.00
- ☐ 12 Arbor Vitae Sprays with Cones $1.00
- Evergreen Boxes— ☐ $2.75 ☐ $4.50 ☐ $10.00

Name .....

Address .....

CHRISTMAS DOOR BELLS



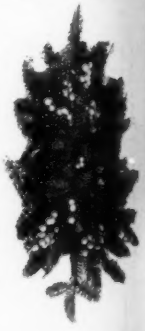
A string of musical bells, woven into fragrant evergreen balsam, with brown cones and red berries. Rings "Welcome!" when door opens.

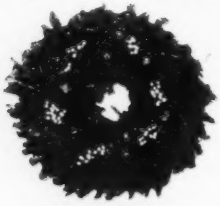
24 in. Spray
$2.50

Balsam Door Sprays

Beautifully designed with cones and berries. Distinctive, long-lasting. Novel for use on doors, instead of the conventional wreath.

24 ins. long
$2.50





NO. 2 WREATH

Berried Sprays

12 for $1.00

Real holly; Winterberry (red); Bittersweet (orange). Large sprays. Order by name.

Christmas Wreath No. 2

One of our loveliest; 15 ins. across, decorated with cones and red berries. Red ribbon bow, 25c extra.

$1.75
3 for $4.50 6 for $8.50

Ask for Aiken Christmas Catalog for full list of wreaths; all prices.

Special Evergreen Boxes

Each contains sprays of evergreens, assorted cones and sprays of Ilex Berry. A box goes a long way in decorating for Xmas.

No. 1, Containing 50 12 to 18 in. sprays $2.75
No. 2. Containing 100 12 to 18 in. sprays $4.50
No. 3. Containing 300 12 to 18 in. sprays $10.00

Evergreen Sprays

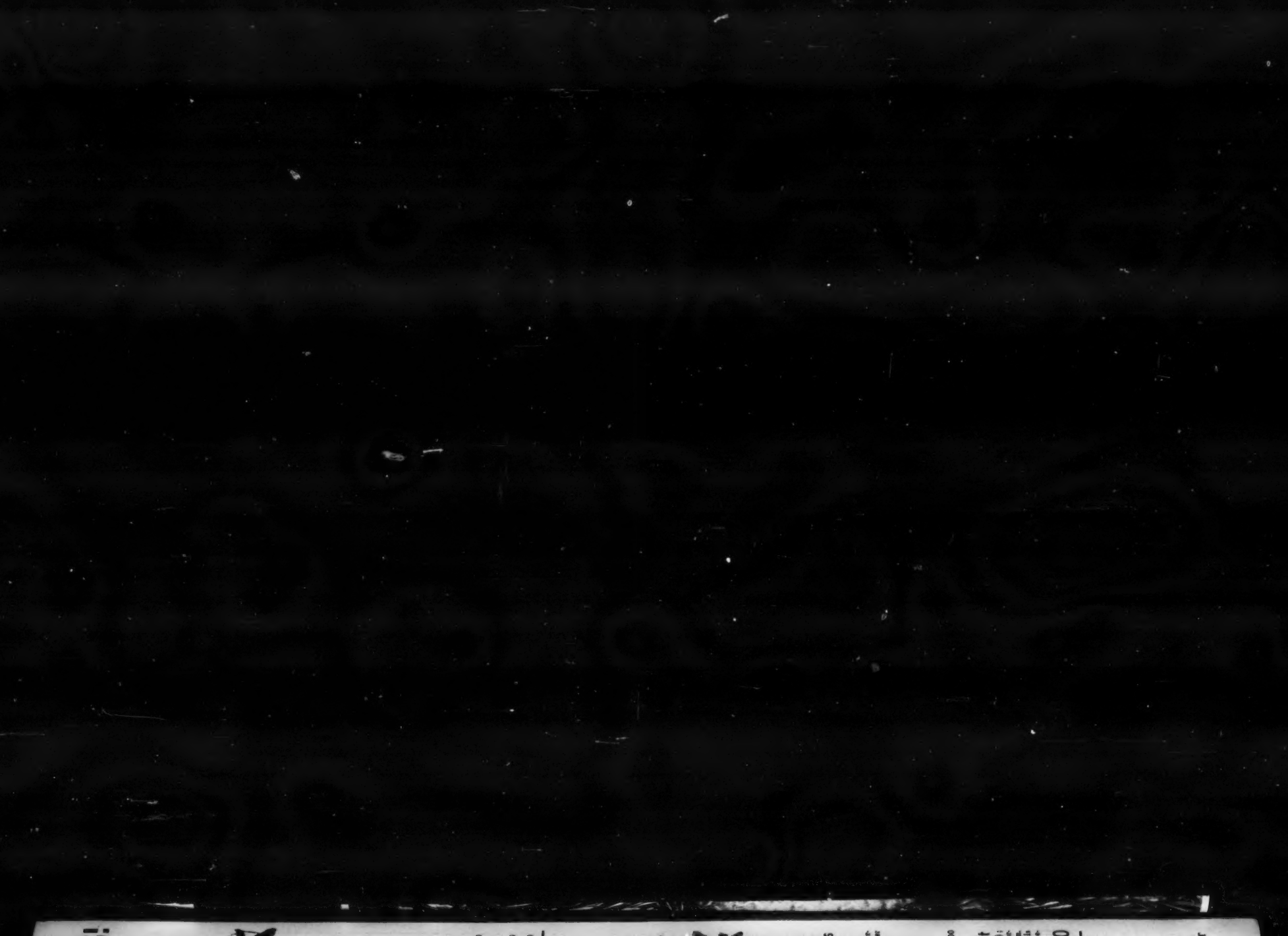
Bearing Cones

Arbor Vitae..... 18 inch ... 12 for $1.00

Complete Fireplace Set

5 yds. Balsam Festooning (roping); 1 12-in. Wreath with cones and berries; 2 Xmas Candlesticks; 1 13-in. diam. Ash Wood Basket; 2 bushels Cones for burning. Give your fireplace these charming holiday decorations! Complete, only..... $7.00

Write for Our Complete Illustrated Christmas Catalog

ORDER EARLY! Give full shipping instructions. State *WHEN* you want your order shipped. Prices F.O.B. Putney, Vt. We prepay Gift Orders and bill you carriage charges.

The AIKEN NURSERIES, Inc. PUTNEY, VERMONT BOX H